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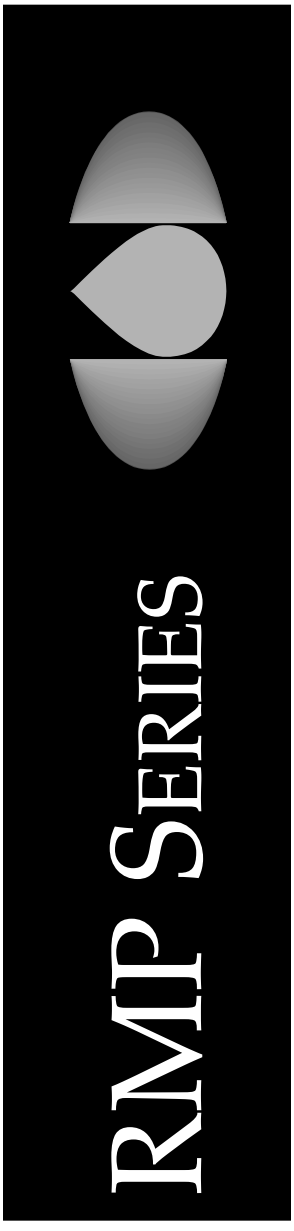
RISK MANAGEMENT PROGRAM GUIDANCE FOR PROPANE STORAGE FACILITIES (40 CFR PART 68)



October 22, 1998

Prepared For: Use by owners and operators of Propane Storage Facilities, Implementing Agencies, and the United States Environmental Protection Agency.

Prepared By: Robert A. Barrish, Richard C. Antoff, and Joseph B. Brabson, Jr. (State of Delaware, Department of Natural Resources and Environmental Control[1] under a cooperative agreement with the United States Environmental Protection Agency).

This document provides guidance to help owners and operators of propane storage facilities to determine if their processes are subject to regulation under section 112(r) of the Clean Air Act and 40 CFR part 68 and to comply with regulations. This document does not substitute for EPA's regulations, nor is it a regulation itself. Thus, it cannot impose legally binding requirements on EPA, states, or the regulated community, and may not apply to a particular situation based upon circumstances. This guidance does not represent final agency action, and EPA may change it in the future, as appropriate.

[1] State of Delaware, Department of Natural Resources and Environmental Control, 715 Grantham Lane, New Castle, Delaware 19720. Telephone (302) 323-4542.

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TABLE OF POTENTIALLY REGULATED ENTITIES

This table is not intended to be exhaustive, but rather provides a guide for readers regarding entities likely to be regulated under 40 CFR part 68. This table lists the types of entities that EPA is now aware could potentially be regulated by this rule and covered by this document. Other types of entities not listed in this table could also be affected. To determine whether your facility is covered by the risk management program rules in part 68, you should carefully examine the applicability criteria discussed in Chapter 1 of this guidance and in 40 CFR 68.10, which is available in Appendix A of this document . If you have questions regarding the applicability of this rule to a particular entity, call the EPCRA/CAA Hotline at (800) 424-9346 (TDD: (800) 553-7672)(see Appendix E, Technical Assistance, for other sources of information and Appendix C for EPA Regional and State contacts).

Category	**NAICS Codes**	**SIC Codes**	**Examples of Potentially Regulated Entities**
Propane dealers	454312	5171 5984	Propane retailers and wholesalers
Propane users			Manufacturing facilities Large institutions Commercial facilities

INTRODUCTION

WHY SHOULD I READ THIS GUIDANCE?

If you handle, store, use, or produce propane in quantities above threshold quantity (10,000 pounds or 2380 gallons) in a single process, you are required to develop and implement a risk management program as a result of a new rule issued by the U.S. Environmental Protection Agency (EPA). This rule, "Chemical Accident Prevention Provisions" (part 68 of Title 40 of the Code of Federal Regulations (CFR)), applies to a wide variety of facilities that manufacture, store, or use toxic and flammable substances, including propane. This document provides guidance on how to determine if you are subject to part 68 and how to comply with part 68. If you are subject to part 68, you must be in compliance no later than June 21, 1999, or the date on which you first have more than a threshold quantity of a regulated substance in a process, whichever is later.

The goal of a risk management program is to prevent accidental releases of toxic and flammable substances that can cause serious harm to the public and the environment and to mitigate the effects of releases that do occur. The 1990 Amendments to the Clean Air Act (CAA) outline the actions to be taken by facilities (referred to in the law as stationary sources) to prevent and mitigate accidental releases of such chemicals into the atmosphere and reduce their potential impact on the public and the environment.

This guidance is intended to assist facilities that handle or store propane. If you handle or store other substances (e.g., chlorine, ammonia), you will need to use EPA's *General Guidance for Risk Management Programs*, or another industry-specific guidance. If you only store propane for use as a fuel or you are a retailer who sells a limited quantity of propane stored in a small tanks, you may be able to use EPA's abbreviated *Risk Management Program Guidance for Propane Users and Small Retailers*.

In general, the rule requires the following:

- Certain facilities must develop and implement a risk management program and maintain documentation of the program at the site.

  The risk management program must include an analysis of the potential offsite consequences of an accidental release, a five-year accident history, a release prevention program, and an emergency response program.

- These facilities must develop and submit a risk management plan (RMP) to EPA no later than June 21, 1999.

  The RMP provides a summary of the risk management program implemented at the facility. The RMP will be available to government agencies and the public.

- These facilities are required to update the RMP at least every five years after the initial submission.

HOW DO I USE THIS DOCUMENT?

This document is designed to give owners and operators of propane storage facilities who are subject to EPA's 40 CFR Part 68 "Accidental Release Prevention Requirements" specific guidance on how their risk management program can be designed to comply with the EPA rule and on what information will be required to complete the risk management plan (RMP). The guidance assumes that a propane distribution facility[2] is exempt from OSHA's 29 CFR 1910.119 "Process Safety Management Standard" (PSM). The format for this model compliance manual is similar to the font type and size used in the LP-Gases Handbook.[3]

The guidance, examples, and commentary are all printed in the same font type and text size that this particular sentence is printed.

The specific text of the EPA Rule is printed in this font type and size.

Boxes similar to the one on the right indicate that the information you are developing is used in another section of the guidance.

Boxes similar to the one on the right indicate that information was previously developed in another section of the guidance.

WHAT SHOULD I DO FIRST?

Before plunging into the development of a risk management program, you should go through the eight steps listed below. This guidance will step you through this process sequentially.

(1) **Collect any forms** that you may have submitted under Sections 311 and 312 of the Emergency Planning and Community Right-to-Know Act (e.g., Tier I or Tier II information).

(2) **Determine, by noting the water capacity of your individual storage tanks, the total propane storage capacity of your facility**. (See Chapter 1)

(3) **Determine if you are covered by this rule**, and if you are, how many of your processes are covered. (See Chapter 1)

Only sources with a threshold quantity of a regulated substance in a process need to comply with this rule. If you handle other substances in excess of their threshold quantities (such as acetylene, butane, or ethyl mercaptan), you must develop a risk management program for

[2] An industrial user of propane may be subject to OSHA PSM. Program 3 prevention program is not part of this guidance. An industrial user subject to OSHA PSM must use EPA's General Guidance for recommendations on the prevention program.

[3] National Fire Protection Association (NFPA), L P-Gases Handbook, Fourth Edition 1995.

those substances as well as for propane. The EPA rule states that you are to file only one risk management plan (RMP) for your facility, so if you have multiple regulated substances in excess of their threshold quantities, you can use the parts of this guidance that apply to propane and supplement your RMP with additional information for the other regulated substances, as described in EPA's *General Guidance for Risk Management Programs (40 CFR Part 68)*. Thus, a facility with multiple regulated substances will submit only one RMP, but will have an individual risk management program appropriate for each regulated substance and covered process.

(4) **Perform the "Offsite Consequence Analysis" to determine your "worst-case" scenario**. (See Chapter 2)

(5) **Determine the appropriate program level for each covered process**. Depending on specific characteristics of your operations, the results of the offsite consequence analysis, and your accident history, your covered process may be subject to one of three different sets of requirements (i.e., Programs 1, 2, or 3). (See Chapters 1 and 2)

(6) **Determine EPA's requirements for your facility and each covered process.** Certain requirements apply to the facility (source) as a whole, while others are process-specific.

(7) **Assess your operation to identify current risk management activities.** Because you probably conduct some risk management activities (e.g., employee training, equipment maintenance, and emergency planning), you should review your current operations to determine if you are already in compliance with certain provisions of this rule. EPA does not expect you to "redo" these activities if they already meet the rule's requirements. Note: for owners and operators of propane storage facilities, this guidance references the NFPA 58, 1998 Edition[4] for the mechanical design of the facility.

(8) **Review the regulations and this guidance to develop a strategy for conducting the additional actions you need to take for each covered process.** This guidance presents a step-by-step approach for propane distributors to follow. It will help you determine if you are regulated and what actions you need to take to come into compliance with this rule.

Finally, keep in mind that many of these requirements are performance-based; for EXAMPLE, EPA does not specify what maintenance must be performed, but allows you to design a maintenance program that fits your facility. Your program will be different from everyone else's program because it will be designed for your specific situation and hazards. It will reflect whether your facility is near the public and sensitive environmental areas, the specific equipment you have installed, and the managerial decisions that you have made.

[4] National Fire Protection Association, NFPA 58, "Liquefied Petroleum Gas Code, 1998 Edition.

WHERE DO I GO FOR MORE INFORMATION?

EPA's risk management program requirements may be found in Part 68 of Volume 40 of the Code of Federal Regulations. A consolidated copy of these regulations is available in Appendix A of the *General Guidance for Risk Management Programs.* EPA is working with industry and local, state, and federal government agencies to assist sources in complying with these requirements. For more information, refer to Appendix E (Technical Assistance) of the *General Guidance*. Appendices C and D of the *General Guidance* also provide points of contact for EPA and OSHA at the state and federal levels for your questions. Your local emergency planning committee (LEPC) also can be a valuable resource and can help you discuss issues with the public.

Finally, if you have access to the Internet, EPA has made copies of the rules, fact sheets, and other related materials available at the home page of EPA's Chemical Emergency Preparedness and Prevention Office (http://www.epa.gov/ceppo/). Please check the site regularly as additional materials are posted.

For more information, call the RCRA, Superfund, & EPCRA Hotline. The Hotline is a publicly accessible service that provides up-to-date information on several EPA programs. The Hotline responds to factual questions on EPA regulations developed under section 112(r) of the Clean Air Act. The Hotline responds to requests for relevant documents. Anyone can call the Hotline; it offers information to a broad audience of callers with diverse backgrounds and varying degrees of regulatory knowledge. To speak with Information Specialists about regulatory questions or to order documents, call: (800) 424-9346 or DC area local (703) 412-9810 or TDD (800) 553-7672 or TDD DC area local (703) 412-3323, Monday through Friday 9:00 a.m. until 6:00 p.m. EST (closed on federal holidays).

DEFINITIONS

Propane, in the context of this guidance, means liquefied petroleum gas or LP-Gas. This is a mixture. It is not a pure substance, but contains propane as its largest single component. For the purposes of the engineering calculations included in this guidance, the other components of the mixture are assumed to have a negligible affect.

Propane distribution facilities use a grade of LP-Gas that complies (as a minimum) with the commercial propane specification issued by the Gas Processors Association (GPA) in Standard 2140-96. LP-Gas must contain an odorant unless further processing makes addition of the odorant harmful. Thus, certain industrial users of propane do not use LP-Gas which contains an odorant.

Butane is also sometimes distributed as a fuel and it can be a minor component of LP-Gas. Propane distribution facilities and industrial users that have butane may adapt this guidance to comply with EPA's accidental release prevention rules.

NFPA-58 defines Liquefied Petroleum Gas (LP-Gas) as any material having a vapor pressure not exceeding that allowed for commercial propane composed predominantly of the following hydrocarbons, either by themselves or as mixtures: propane, propylene, butane (normal butane or isobutane), and butylenes.

*A **process** means any activity involving a regulated substance including any use, storage, manufacturing, handling, or on-site movement of such substances, or combination of these activities. For the purposes of this definition, any group of vessels that are interconnected, or separate vessels that are located such that a regulated substance could be involved in a potential release, shall be considered a single process.*

This guidance is meant to assist propane storage facilities with complying with EPA's risk management rule. One of the most common types of storage facilities potentially subject to EPA's risk management rule is a propane distribution facility.

A **propane distribution facility** as defined by NFPA-58 "[a] facility, the primary purpose of which is the distribution of gas, that receives LP-Gas by tank car, tank truck, or piping, distributing this gas to the end user by portable container (package) delivery, by tank truck, or through gas piping. Such plants have bulk storage tank(s) greater than 2,000 gallons (7.6 m^3) water capacity and usually have container-filling facilities on the premises. Normally, no persons other than the plant management or plant employees have access to these facilities. A facility that transfers LP-Gas from tank cars on a private track directly into cargo tanks is also in this category." This guidance is also applicable to industrial users of propane who handle or store propane in quantities greater than the threshold quantity of 10,000 pounds.

Under the above definitions, a propane storage facility having several interconnected LP-Gas storage tanks (a storage tank is used here to describe LP-Gas storage tanks larger than 2800 gallons of combined water capacity) would be considered "one" process. Similarly, a propane storage facility having several LP-Gas storage tanks or other vessels containing propane, that are not interconnected,

but are sufficiently close together that they could be involved in a single accident (e.g., if a fire could involves a number of storage vessels), would also be considered "one" process. Multiple, widely separated, not interconnected, LP-Gas storage vessels would be considered more than "one" process if they could not be involved in a single accident. Therefore, propane storage facilities are most likely going to have only "one" process unless the physical arrangement of the storage tanks precludes beyond a reasonable doubt the possible mutual involvement of the tanks in any conceivable release scenario.

Propane storage facility can be any of the following types of facility that stores or handles propane in quantities greater than the threshold quantity:

- A propane distribution facility,
- An industrial user of propane
  - Those using propane for fuel for building or process heat.
  - Those using propane for refrigeration.
  - Those using propane as a carrier gas (e.g., an aerosol propellant).
  - Those using propane as a chemical feed stock.
- An institution (e.g., a hospital or government installation) that uses propane for fuel.

LP-Gas processors conforming to American Petroleum Institute (API) standards rather than NFPA standards may not rely on this guidance. The checklists are not appropriate for these facilities, because the checklists are based on NFPA standards.

CHAPTER 1: APPLICABILITY AND PROGRAM LEVELS

DOES THIS RULE APPLY TO ME?

68.10 Applicability

(a) An owner or operator of a stationary source that has more than a threshold quantity of a regulated substance in a process, as determined under § 68.115, shall comply with the requirements of this part no later than the latest of the following dates:

(1) June 21, 1999;

(2) Three years after the date on which a regulated substance is first listed under § 68.130; or

(3) The date on which a regulated substance is first present above a threshold quantity in a process.

You must first determine if your propane storage facility is subject to EPA's Rule "*Accident Release Prevention Requirements: Risk Management Programs Under Clean Air Act Section 112(r)(7)*". If you store more than 10,000 pounds (2381 gallons @ 60 °F) of propane in a process at your facility, you are subject to the rule.

HOW DO I DETERMINE THE AMOUNT OF PROPANE STORED IN A PROCESS AT MY FACILITY?

To answer the question of whether you are regulated, you need to calculate the total quantity (in pounds) of propane stored in all your facility's storage tanks that are interconnected or co-located (i.e., close enough to be involved in a single accident); see Appendix A for additional guidance on determining whether your propane tanks are co-located. If this total quantity exceeds the threshold of 10,000 pounds, you are regulated.

First determine the water capacity of each tank. The nominal nameplate capacity (in gallons of water) can be found on the "*U1A*" certificate for the vessel. The *U1A* certificate is issued to the owner by the manufacturer of a boiler or a pressure vessel and contains important information relating to the design and construction of the vessel. Manufacturers may file a copy of this document with the National Board of Boiler and Pressure Vessel Inspectors[5], for future reference by the original or subsequent owners of the vessel. The nominal nameplate capacity can also be found on the permanently attached nameplate on your storage tank. The nameplate will also have the National Board Number for your vessel. This number is key to retrieving your *U1A* form from National Board. These nameplates are usually located on one of the hemispherical heads of the vessel, the

[5] National Board of Boiler and Pressure Vessel Inspectors, 1055 Crupper Avenue, Columbus, OH 43229. Telephone (614) 888-8320.

manway or on the manway cover. Obtain the nominal capacity for all your tanks from the nameplate or from the *U1A* form and record these nominal water capacities in Column 1 of Worksheet 1.

The second step is to calculate the amount of propane you store. The following method can be used to determine the total amount of propane stored at your facility (the maximum intended inventory).

HOW TO USE TABLE 2 TO FIND THE MAXIMUM INTENDED INVENTORY

Table 2 summarizes the conversion of nominal water capacity in gallons to pounds of "commercial" propane @ 60 °F so that you may determine the maximum intended capacity of each of your propane storage tank(s) in a process. The multiplier 3.696 (used in Table 2 to convert gallons to pounds) was developed based on the density of "commercial" propane (4.20 pounds per gallon[6]) multiplied by the maximum permitted liquid volume (88% @ 60°F[7]). The inventory in pounds is rounded to the nearest thousand. If you have written administrative controls that limit the quantity in your vessels to some other percentage, you should adjust these figures to account for your controls. Base your decision on the actual maximum quantity that you may have in the vessel, not the maximum capacity of the vessel.

This rule applies to regulated substances that are handled at "stationary sources." Transportation containers used for storage not incident to transportation and transportation containers connected to equipment at a stationary source are considered part of the stationary source. Transportation containers that have been unhooked from the motive power that delivered them to the site (e.g., truck or locomotive) and left on your site for short-term or long-term storage are part of your stationary source. For example, if you have railcars on a private siding that you use as storage tanks until you are ready to hook them to your process, these railcars should be considered to be part of your source. If a tank truck is being loaded **and** the motive power is still attached, the truck and its contents are considered to be in transportation and not covered by the rule. You should count only the substances in the piping or hosing as well as the quantity in the storage tank.

Record the amount of propane in pounds from the right column across from the water capacity of your tank on Worksheet 1. Do this for each of your vessels in the process. Total the amount of propane in pounds and record this in the box at the bottom of Worksheet 1. You must complete Worksheet 1 for each propane process at your propane storage facility. The total in the box at the bottom of Worksheet 1 rounded to two significant figures is the maximum inventory for that process and will be the quantity you list in the registration section of your risk management plan. If you have multiple processes at the same facility, you are only required to submit one risk management plan, but you are required to list each process and its quantity separately. If you have multiple facilities, you will have to submit a risk management plan for each facility that lists all the processes at each facility.

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[6] NFPA 58, 1998 Edition, Liquefied Petroleum Gas Code, Table B-1.2, pg 81.

[7] NFPA 58, 1998 Edition, Liquefied Petroleum Gas Code, Table 4-4.2.2(b), pg 52.

TABLE 1
TYPICAL WATER CAPACITY OF PROPANE TANKS,
TRANSPORTS AND RAILROAD TANK CARS

Storage Tank	12,000 Gallons
Storage Tank	18,000 Gallons
Storage Tank	30,000 Gallons
Storage Tank	40,000 Gallons
Storage Tank	60,000 Gallons
Storage Tank	100,000 Gallons
Storage Tank	120,000 Gallons
Transport (Cargo Tank)	8,000 - 11,000 Gallons
Rail Car DOT Class 105J300W & 105A300W	11,000 - 34,500 Gallons
Rail Car DOT Class 112J340W & 112T340W	26,000 - 34,500 Gallons
Rail Car DOT Class 114J340W & 114T340W	26,000 - 34,500 Gallons
Rail Car DOT Class 114J400W & 114T400W	26,000 - 34,500 Gallons
Bobtails (Delivery Cargo Tank)	750 - 3200 Gallons

TABLE 2
NOMINAL TANK CAPACITY TO POUNDS[8]
(Filled to 88% capacity)

Tank Capacity (gallons of water)	Propane (pounds)	Butane (pounds)
500	1800	2000
1000	3700	4100
1500	5500	6100
2000	7400	8200
2500	9200	10,000
2700	10,000	11,000
2701 - 5000	14,000	16,000
5001 - 7000	22,000	25,000
7001 - 9000	30,000	33,000
9001 - 11,000	37,000	41,000
11,001 - 13,000	44,000	49,000
13,001 - 15,000	52,000	57,000
15,001 - 17,000	59,000	65,000
17,001 - 19,000	67,000	74,000
19,001 - 21,000	74,000	82,000
21,001 - 23,000	81,000	90,000
23,001 - 25,000	89,000	98,000
25,001 - 27,000	96,000	110,000
27,001 - 29,000	100,000	110,000
29,001 - 31,000	110,000	120,000
31,001 - 33,000	120,000	130,000
33,001 - 35,000	130,000	140,000

[8] Note Table 1 is ***not*** to be used as a replacement for the "Maximum Permitted Liquid Volume" given in Table 4.2.2(b) of NFPA 58, 1998 Edition.

Tank Capacity (gallons of water)	Propane (pounds)	Butane (pounds)
35,001 - 37,000	130,000	150,000
37,001 - 39,000	140,000	160,000
39,001 - 41,000	150,000	160,000
41,001 - 43,000	160,000	170,000
43,001 - 45,000	160,000	180,000
45,001 - 47,000	170,000	190,000
47,001 - 49,000	180,000	200,000
49,001 - 51,000	190,000	200,000
51,001 - 53,000	190,000	210,000
53,001 - 55,000	200,000	220,000
55,001 - 57,000	210,000	230,000
57,001 - 59,000	210,000	240,000
59,001 - 61,000	220,000	250,000
61,001 - 63,000	230,000	250,000
63,001 - 65,000	240,000	260,000
65,001 - 70,000	250,000	280,000
70,001 - 80,000	280,000	310,000
80,001 - 90,000	310,000	350,000
90,001 - 100,000	350,000	390,000
100,001 - 110,000	390,000	430,000
110,001 - 120,000[9]	430,000	470,000

[9] For tanks larger than 120,000 gallons use the following calculation to determine the pounds of propane at 88 percent capacity. (Tank size, in gallons of water) x 3.696 = (propane capacity in pounds). Round to two significant figures. Example: 160,000 × 3.696 = 590,000 pounds. For butane the multiplier is 4.08.

EXAMPLE 1
USING WORKSHEET 1 — TANK CAPACITY/INVENTORY —
FOR USE WITH TABLE 2
(Complete one for each process)

Tanks in the Process	Column 1 Tank Water Capacity (gallons)	Column 2 Max. Inventory of Propane (pounds)
Tank 1	18,678	67,000
Tank 2	30,927	110,000
Tank 3	60,899	220,000
Tank 4	N/A	N/A
Tank 5	N/A	N/A
Tank 6	N/A	N/A
Tank 7	N/A	N/A
Tank 8	N/A	N/A
Tank 9	N/A	N/A
Tank 10	N/A	N/A
Total		**400,000**

Unless you always store less than these quantities in these tanks (i.e., you fill your tanks to less than 88 percent capacity), 400,000 pounds is the maximum quantity in this process.

Largest Tank Number (from Table above) **3**.

Largest Tank water capacity **60,899** gallons

Largest Tank maximum inventory **220,000** pounds.

WORKSHEET 1 — TANK CAPACITY/INVENTORY — FOR USE WITH TABLE 2

(Complete one for each process)

Tanks in the Process	Column 1 Tank Water Capacity (gallons)	Column 2 Max. Inventory of Propane (pounds)
Tank 1		
Tank 2		
Tank 3		
Tank 4		
Tank 5		
Tank 6		
Tank 7		
Tank 8		
Tank 9		
Tank 10		
Total[10]		

This is your maximum inventory

Used in Chapter 2

Largest Tank Number (from Table above) _____

Largest Tank water capacity _____ gallons.

Largest Tank water capacity converted to pounds of propane _____ pounds.

[10] Do not forget to round to two significant figures.

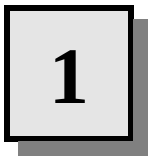
PROGRAM LEVELS AND APPLICABILITY

68.10 Applicability.

Once you have determined that this rule is applicable (i.e., that you store more than 10,000 pounds of propane in a process), you must determine what Program level applies to each process. The rule imposes different requirements on processes based on the relative potential risks to the public and level of effort needed to prevent accidents. Three levels of requirements are as follows:

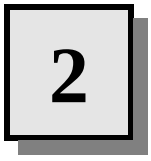
(b) Program 1 eligibility requirements. A covered process is eligible for Program 1 requirements as provided in § 68.12(b) if it meets all of the following requirements:

(1) For five years prior to the submission of an RMP, the process has not had an accidental release of a regulated substance where exposure to substance, its reaction products, overpressure generated by an explosion involving the substance, or radiant heat generated by a fire involving the substance led to any of the following offsite:
(I) Death;
(ii) Injury; or
(iii) Response or restoration activities for an exposure of an environmental receptor;
(2) The distance to a toxic or flammable endpoint for a worst-case release assessment conducted under Subpart B and § 68.25 is less than the distance to any public receptor, as defined in § 68.30; and
(3) Emergency response procedures have been coordinated between the stationary source and local emergency planning and response organizations.



Program 1: A process with no public receptors within the distance to the endpoint from a worst-case release and with no accidents with specific offsite consequences within the past five years is eligible for Program 1, which imposes minimal requirements on the process. Some propane storage facilities will be eligible for Program 1.

(c) Program 2 eligibility requirements. A covered process is subject to Program 2 requirements if it does not meet the eligibility requirements of either paragraph (b) or paragraph (d) of this section.



Program 2: A process which is not eligible for Program 1 nor subject to Program 3 is placed in Program 2, which imposes a streamlined prevention program. Most propane storage facilities not eligible for Program 1 will be eligible for Program 2.

(d) Program 3 eligibility requirements. A covered process is subject to Program 3 if the process does not meet the requirements of paragraph (b) of this section, and if either of the following conditions is met:

(1) The process is in NAICS code 32211, 32411, 32511, 325181, 325188, 325192, 325199, 325211, 325311, or 32532; or

(2) The process is subject to the OSHA process safety management standard, 29 CFR 1910.119.

Program 3: A process not eligible for Program 1 and that is either subject to OSHA's PSM standard or in one of the ten specified North American Industry Classification System codes is placed in Program 3, which imposes the OSHA PSM program as the prevention program. OSHA exempts retailers, who are defined as facilities whose sales to end users account for more than half of the total sales from the facility. Thus a propane distribution facility with a large wholesale business may be subject to OSHA PSM. OSHA also exempts propane when used solely as a fuel if such fuels are not part of a process containing another highly hazardous chemical covered by the OSHA PSM standard. If you use propane (above 10,000 pounds) either in a chemical process as a feedstock, as a refrigerant, as the carrier gas for aerosol propellants containers, or as a fuel for heating a process or process equipment that contains another OSHA PSM substance, you will be subject to OSHA PSM and Program 3. OSHA PSM would also apply to a propane storage vessels that are close enough to vessels containing another OSHA PSM-regulated substance to be considered co-located with them.

It is unlikely that a propane distribution facility will be subject to Program 3. Industrial users of propane, however, will need to consider carefully whether they are required to implement Program 3 requirements and prepare the appropriate justification that supports the level selection.

This guidance is mainly geared to help those propane storage facilities that qualify for Programs 1 or 2. If you are subject to Program 3, you should consult OSHA and EPA's *General Guidance*. At your discretion, you may use sections of this guidance to supplement your Program 3 risk management program and risk management plan.

If you can qualify a process for Program 1, it is in your best interests to do so from an enforcement standpoint, even if the process is already subject to OSHA PSM. For Program 1 processes, the agency implementing part 68 will inspect and enforce only for compliance with the minimal Program 1 requirements. If you assign a process to Program 2 or 3, when it might qualify for Program 1, the implementing agency will inspect or enforce for compliance with all the requirements of the higher program levels. On the other side, you have from now until June 21, 1999, to implement whichever program level that you decide is appropriate. If an accident should make you change from a lower program level to a higher program level, you will only have six months to implement the higher program level requirements. This guidance will help you make your Program level determination as you complete the various sections of the program.

KEY POINTS TO REMEMBER

In determining program level(s) for your process(es), keep in mind the following:

(1) **Each process is assigned to a program level,** which indicates the risk management measures necessary to comply with this regulation for that process, not the facility as a whole. The eligibility of one process for a program level does not influence the eligibility of other covered processes for other program levels.

(2) **Any process that meets the criteria for Program 1 can be assigned to Program 1**, even if it is subject to OSHA PSM or is in one of the SIC codes listed for Program 3.

(3) **Program 2 is the default program level.** There are no "standard criteria" for Program 2. Any process that does not meet the criteria for either Programs 1 or 3 is subject to the requirements for Program 2.

(4) **Only one Program level can apply to a process.** If a process consists of multiple vessels, the highest Program level that applies to any segment of the process applies to all parts.

DETERMINING PROGRAM 1 ELIGIBILITY

For a process to be eligible for Program 1, it must meet two basic criteria (the third criteria, coordination with public responders applies to all three Program levels):

- There must be no public receptors within the distance to an endpoint from the worst-case release scenario for the process; and
- No accidental release of propane from the process can have caused offsite deaths, injuries, or response or restoration activities for an environmental receptor.

The following sections of this chapter discuss the meaning of "public receptor," "environmental receptor," and "injury." Chapter 2 describes how to determine your distance to an endpoint. A process may have had accidental releases that you will need to report in the five-year accident history, and yet the process may still be eligible for Program 1 because the criteria for Program 1 and the five-year accident history are not the same.

WHAT IS A PUBLIC RECEPTOR?

The rule (§ 68.3) defines **public** as "any person except an employee or contractor of the stationary source." Consequently, employees of other facilities that may share your site are considered members of the public even if they share the same physical location. Being "the public," however, is not the same as being a public receptor.

Public receptors include "offsite residences, institutions (e.g., schools and hospitals), industrial, commercial, and office buildings, parks, or recreational areas inhabited or occupied by the public at any time without restriction by the stationary source where members of the public could be exposed to toxic concentrations, radiant heat, or overpressure, as a result of an accidental release." **Offsite** means areas beyond your property boundary and "areas within the property boundary to which the public has routine and unrestricted access during or outside business hours."

The first step in identifying public receptors is determining what is "offsite." For most facilities, that determination will be straightforward. If you restrict access to all of your property all of the time, "offsite" is anything beyond your property boundaries. Ways of restricting access include fully fencing the property, placing security guards at a reception area or using ID badges to permit entry.

If you do not restrict access to a section of your property and the public has routine and unrestricted access to it during or after business hours, that section would be "offsite." For example, if your operations are fenced but the public has unrestricted access to your parking lot during or after business hours, the parking lot is "offsite." In the case of facilities such as hospitals, schools, and hotels that shelter members of the public as part of their function or business, the parts of the facility that are used to shelter the public would be "offsite."

Not all areas offsite are potential public receptors. The point of identifying public receptors is to locate those places where there are likely to be, at least some of the time, members of the public whose health could be harmed by short-term exposure to an accidental release at your site. The basic test for identifying a public receptor is thus whether an area is a place where it is reasonable to expect that members of the public will routinely gather at least some of the time.

The definition of "public receptor" itself specifies the types of areas where members of the public may routinely gather at least some of the time: residences, institutions such as hospitals and schools, buildings in general, parks and recreational areas. There should be little difficulty in identifying residences, institutions and businesses as such, and virtually any residence, institution and business will qualify as a public receptor, even when the property is used only seasonally (as in a vacation home). Notably, a residence includes its yard, if any, and an institution or business includes its grounds to the extent that employees or other members of the public are likely to routinely gather there at least some of the time for business or other purposes (see discussion of recreational areas below). The only circumstances that would justify not considering such a property a public receptor would be where your facility owns or controls the property and restricts access to it, or no member of the public inhabits or occupies it at any time. Where a hospital, school, hotel or other entity that provides public shelter is itself subject to the part 68 rule (e.g., because of on-site propane storage tanks), it will be its own public receptor except for those areas where members of the public are not allowed to go at any time.

Buildings other than residences, institutions or businesses are also highly likely to qualify as public receptors since the function of most buildings is at least in part to shelter people. Accordingly, toll booth plazas, transit stations, and airport terminals would qualify as public receptors. For a building not to qualify as a public receptor, one of the circumstances mentioned above would have to apply.

Every designated park or recreational area, or at least some portion thereof, is apt to be a public gathering place by virtue of facilities made available to the public (e.g., visitors' center, playground, golf course, camping or picnic area, marina or ball field) or attributes that members of the public routinely seek to use (e.g., beach). It does not matter whether use of such facilities is seasonal; routine use for at least part of the year would qualify the area as a public receptor.

At the same time, some portion of a designated park or recreational area may not be a public receptor. For instance, a large state or national park may include relatively inaccessible tracts of land that do not contain public facilities or receive routine use. Occasional hiking, camping or hunting in such areas would not qualify the areas as public receptors.

An area need not be designated a recreational area to be one in fact. If an area is routinely used for recreational purposes, even if only seasonally, it is a recreational area for purposes of the part 68

rule. For example, a marina may not bill itself as a "recreational area," but if a marina houses recreational boats, it qualifies as a public receptor. Further, if your facility or a neighboring property owner allows the public to make routine recreational use of some portion of land (e.g., a ball field or fishing pond), that portion of land would qualify as a public receptor.

Roads and parking lots are not included as such in the definition of "public receptor." Neither are places where people typically gather; instead they are used to travel from one place to another or to park a vehicle while attending an activity elsewhere. However, if a parking lot is predictably and routinely used as a place of business (e.g., a farmer's market) or for a recreational purpose (e.g., a county fair), it would qualify as a public receptor.

In general, farm land would not be considered a public receptor. However, if farm land, or a portion thereof, is predictably and routinely occupied by farm workers or other members of public, even if only on a seasonal basis, that portion of the land would be a public receptor.

If you are in doubt about whether to consider certain areas around your facility as public receptors, you should consult with the relevant local officials and land owners and your implementing agency for guidance.

WHAT IS A DISTANCE TO AN ENDPOINT FROM A WORST-CASE RELEASE?

In broad terms, the distance to an endpoint is the distance a toxic vapor cloud, fire, or explosion from an accidental release will travel before dissipating to the point that serious injuries from short-term exposures will no longer occur. For propane (and other flammables) the endpoint is an overpressure of 1 psi. Beyond that endpoint, the effects on people are not considered to be severe enough to merit the need for additional action under this rule.

WHAT IS AN INJURY?

An injury is defined as "any effect on a human that results either from direct exposure to toxic concentrations; radiant heat; or overpressures from accidental releases or from the direct consequences of a vapor cloud explosion (such as flying glass, debris, and other projectiles) from an accidental release." The effect must "require medical treatment or hospitalization." This definition is taken from the OSHA regulations for keeping employee injury and illness logs and should be familiar to most employers. Medical treatment is further defined as "treatment, other than first aid, administered by a physician or registered professional personnel under standing orders from a physician." The definition of medical treatment will likely capture most instances of hospitalization. However, if someone goes to the hospital following direct exposure to a release and is kept overnight for observation (even if no specific injury or illness is found), that would qualify as hospitalization and so would be considered an injury.

WHAT IS AN ENVIRONMENTAL RECEPTOR?

The environmental receptors you need to consider are limited to natural areas such as national or state parks, forests, or monuments; officially designated wildlife sanctuaries, preserves, refuges, or areas; and Federal wilderness areas. All of these areas can be identified on local U.S. Geological Survey maps.

WHAT ARE RESTORATION AND RESPONSE ACTIVITIES?

The type of restoration and response activity conducted to address the impact of an accidental release will depend on the type of release (volatilized spill, vapor cloud, fire, or explosion), but may include such activities as:

- Collection and disposal of dead animals and contaminated plant life;
- Collection, treatment, and disposal of soil;
- Shutoff of drinking water;
- Replacement of damaged vegetation; or
- Isolation of a natural area due to contamination associated with an accidental release.

PROGRAM LEVEL APPLICABILITY

It is expected that most propane storage facilities will have no accidents that meet the criteria (i.e., that have resulted in offsite deaths, injuries, or response or restoration activities for exposure of an environmental receptor. Have you had an accidental release of propane that meets this definition? _____ (Yes or No)

From Worksheet 3, Chapter 2 record the distance to endpoint for your worst-case scenario_____ miles.

Used in Chapter 2

To define the area of potential impact from the worst-case release, draw a circle on a map, using the process as the center and the distance to the endpoint as the radius. If there are public receptors within that area, your process is not eligible for Program 1.

If you answered "NO," there are no public receptors within the distance to endpoint for your worst case, and if you have determined that you have not had an accidental release of propane as defined in § 68.10(b)(1) within the five years prior to RMP submission, you are eligible for Program 1.

Unless eligible for Program 1, a propane storage process is Program 3 if it is covered by OSHA's Process Safety Management Standard (PSM) [29 CFR 1910.119] or in one of the ten NAICS codes. Most propane storage facilities are exempt from OSHA's PSM standard, provided that they qualify for any one of the following OSHA's exemptions:

- Retail facility.
- Hydrocarbon fuels used solely for workplace consumption as a fuel (e.g., propane used for comfort heating)...if such fuels are not part of a process containing another highly hazardous chemical covered by the PSM standard.
- A normally unoccupied, remote facility.
- An oil or gas drilling or servicing operation.

Note: Propane Distributors with a large wholesale business may be subject to OSHA PSM and thus to Program 3.

If you are subject to Program 3, you must also complete § 68.28 "Alternative Flammable Release Scenarios" and subpart D Program 3 Prevention Program. You will need to consult EPA's *General Guidance* for information on Program 3 Prevention Program.

A propane storage process is Program 2, if it is neither Program 1 nor Program 3. It is expected that most propane distributors will be Program 2.

Record your program level ____.

If you are subject to Program 2, it will be necessary for you to complete § 68.28 "Alternative Flammable Release Scenarios" and all of SUBPART C Program 2 Prevention Program.

SUMMARY OF PROGRAM REQUIREMENTS

Regardless of the program levels of your processes, you must complete a five-year accident history for each process and submit an RMP that covers all processes. Depending on the Program level of each of your processes, you must comply with the additional requirements described below. Exhibit 1 lists them in more detail.

Program 1. For each Program 1 process, you must conduct and document a worst-case release analysis. You must coordinate your emergency response activities with local responders and sign the Program 1 certification as part of your RMP submission.

Programs 2 and 3. For all Program 2 and 3 processes, you must conduct and document at least one worst-case release analysis to cover all toxics and one to cover all flammables. You may need to conduct additional worst-case release analyses if worst-case releases from different parts of your facility would affect different public receptors. You must also conduct one alternative release scenario analysis for all flammables. You must coordinate your emergency response activities with

local responders and, if you use your own employees to respond to releases, you must develop and implement an emergency response program.

For each Program 2 process, you must implement all of the elements of the Program 2 prevention program: safety information, hazard review, operating procedures, training, maintenance, compliance audits, and incident investigations.

For each Program 3 process, you must implement all of the elements of the Program 3 prevention program: process safety information, process hazard analysis, standard operating procedures, training, mechanical integrity, compliance audits, incident investigations, management of change, pre-startup reviews, contractors, employee participation, and hot work permits.

EXHIBIT 1 COMPARISON OF PROGRAM REQUIREMENTS		
Program 1	**Program 2**	**Program 3**
Worst-case release analysis	**Worst-case release analysis**	**Worst-case release analysis**
	Alternative release analysis	**Alternative release analysis**
5-year accident history	**5-year accident history**	**5-year accident history**
	Document management system	**Document management system**
Prevention Program		
Certify no additional prevention steps needed	**Safety Information**	**Process Safety Information**
	Hazard Review	**Process Hazard Analysis.**
	Operating Procedures	**Operating Procedures**
	Training	**Training**
	Maintenance	**Mechanical Integrity**
	Incident Investigation	**Incident Investigation**
	Compliance Audit	**Compliance Audit**
		Management of Change
		Pre-Startup Review
		Contractors
		Employee Participation
		Hot Work Permits
Emergency Response Program		
Coordinate with local responders	**Develop plan and program (if applicable) and coordinate with local responders**	**Develop plan and program (if applicable) and coordinate with local responders**
Submit One Risk Management Plan for All Covered Processes		

CHAPTER 2: OFFSITE CONSEQUENCE ANALYSIS

You are required to conduct an offsite consequence analysis to provide information to the government and the public about the potential consequences of an accidental chemical release. The offsite consequence analysis (OCA) consists of two elements:

- ✦ A worst-case release scenario and
- ✦ Alternative release scenarios (Program 2 and Program 3 processes only).

To simplify the analysis and ensure a common basis for comparisons, EPA has defined the worst-case scenario as the release of the largest quantity of a regulated substance from a single vessel or process line failure that results in the greatest distance to an endpoint.

RMP*Comp™

To assist those using this guidance, the National Oceanic and Atmospheric Administration (NOAA) and EPA have developed a software program, RMP*Comp™, that performs the calculations described in this document. This software can be downloaded from the NOAA Internet website at http://response.restoration.noaa.gov/chemaids/rmp/rmp.html.

The methodology and reference tables of distances presented here are optional. You are not required to use this guidance. You may use publicly available or proprietary models to do your offsite consequence analysis, subject to certain conditions. If you choose to use other models, you should review the rule and Chapter 4 of the *General Guidance for Risk Management Programs,* which outline required conditions for use of other models.

WORST-CASE ANALYSIS

68.25 Worst-case release scenario.

(a) The owner or operator shall analyze and report in the RMP:
(1) For Program 1 processes, one worst-case scenario for each Program 1 process;
(2) For Program 2 and 3 processes:
[(I) Not Applicable (pertains to toxic worst-case).]
(ii) One worst-case release scenario that is estimated to create the greatest distance in any direction to an endpoint defined in § 68.22(a) resulting from an accidental release of regulated flammable substances from covered processes under worst-case conditions defined in § 68.22; and
(iii) Additional worst-case release scenarios for a hazard class if a worst-case release from another covered process at the stationary source potentially affects public receptors different from those potentially affected by the worst-case scenario developed under paragraphs (a)(2)(I) or (a)(2)(ii) of this section.

(b) Determination of worst-case release quantity. The worst-case release quantity shall be the greater of the following:
(1) For substances in a vessel, the greatest amount held in a single vessel, taking into account administrative controls that limit the maximum quantity; or
(2) For substances in pipes, the greatest amount in a pipe, taking into account administrative controls that limit the maximum quantity.
(c) Worst -case release scenario—toxic gases. [Not applicable]
(d) Worst-case release scenario—toxic liquids. [Not applicable]
(e) Worst-case release scenario—flammables. The owner or operator shall assume that the quantity of the substance, as determined under paragraph (b) of this section, vaporizes resulting in a vapor cloud explosion. A yield factor of 10 percent of the available energy released in the explosion shall be used to determine the distance to the explosion endpoint if the model used is based on TNT-equivalent methods.
(f) Parameters to be applied. The owner or operator shall use the parameters defined in § 68.22 to determine distance to the endpoints. The owner or operator may use the methodology provided in the RMP Offsite Consequence Analysis Guidance or any commercially or publicly available air dispersion modeling techniques, provided the techniques account for the modeling conditions and are recognized by industry as applicable as part of current practices. Proprietary models that account for the modeling conditions may be used provided the owner or operator allows the implementing agency access to the model and describes model features and differences from publicly available models to local emergency planners upon request.
(g) Consideration of passive mitigation. Passive mitigation systems may be considered for the analysis of worst case provided that the mitigation system is capable of withstanding the release event triggering the scenario and would still function as intended.
(h) Factors in selecting a worst-case scenario. Notwithstanding the provisions of paragraph (b) of this section, the owner or operator shall select as the worst case for flammable regulated substances . . . a scenario based on the following factors if such a scenario would result in a greater distance to an endpoint defined in § 68.22(a) beyond the stationary source boundary than the scenario provided under paragraph (b) of this section:
(1) Smaller quantities handled at higher process temperature or pressure; and
(2) Proximity to the boundary of the stationary source.

Everyone subject to the rule must analyze at least one worst-case scenario. Complete the analysis for propane and determine the greatest offsite impact distance. For the purposes of the analysis, you must assume that the entire contents of your largest tank is released, a vapor cloud forms (with all the mass of the tank within the flammable range), and a detonation occurs. The analysis incorporates a 10 percent yield factor for TNT-equivalency models. The distance to endpoint is defined as the distance over which a minimum pressure of one (1) pound per square inch (psi) occurs from the pressure wave formed by the detonation.

To conduct this hazard assessment analysis, you may use Worksheet 2 along with Table 3 or you may use EPA's *RMP Offsite Consequence Analysis Guidance* or some other recognized model. To use Worksheet 2, complete the following steps:

1. In the left hand column of Worksheet 2, record the nominal water capacity for each of your bulk propane storage tanks. Do not include tanks used for transportation and still attached to their motive power. You can transfer the nominal water capacity information from Worksheet 1 to Worksheet 2.

2. Find the range of nominal water capacities in Table 3 that encompasses your actual tank inventory. If you have administrative controls that require that the tank be filled to less than 88 percent capacity at all times, you should adjust the numbers from Table 3 to reflect the smaller inventories in your tanks. Record the distance to endpoint for your corresponding storage tank in the right hand column of Worksheet 2.

3. Repeat these steps for each storage tank.

See example 2. For example, a storage tank with a nominal water capacity of 30,000 gallons of water is in the range of 23,001 - 47,000 gallons and corresponds to 0.4 miles for distance to the endpoint.

Use Table 3 below to calculate the distance to the endpoint of 1 psi overpressure for each of your propane storage tanks:

TABLE 3
NOMINAL TANK CAPACITY VS DISTANCE TO ENDPOINT

Nominal Water Capacity (Gallons)	Propane Distance to Endpoint (Miles)	Butane Distance to Endpoint (Miles)
500 - 1,750	0.1	0.1
1,751 - 7,000	0.2	0.2
7,001 - 21,000	0.3	0.3
21,001 - 23,000	0.3	0.4
23,001 - 47,000	0.4	0.4
47,001 - 51,000	0.4	0.5
51,001 - 90,000	0.5	0.5
90,001 - 120,000	0.6	0.6

EXAMPLE 2
USING WORKSHEET 2 TO FIND WORST-CASE DISTANCE TO ENDPOINT

	Nominal Water Capacity (Gallons)	Distance to Endpoint (Miles)
Tank 1	**18,678**	**0.3**
Tank 2	**30,927**	**0.4**
Tank 3	**60,899**	**0.5**
Tank 4	**N/A**	**N/A**
Tank 5	**N/A**	**N/A**
Tank 6	**N/A**	**N/A**
Tank 7	**N/A**	**N/A**
Tank 8	**N/A**	**N/A**
Tank 9	**N/A**	**N/A**
Tank 10	**N/A**	**N/A**

Record the amount contained in your largest tank: 220,000 pounds, remembering to adjust for administrative controls if you always fill your tanks to less than 88 percent capacity. You have already calculated this in Chapter 1, Worksheet 1.

Record the distance to endpoint for your largest tank: 0.5 miles.

This is your "worst-case scenario."

WORKSHEET 2
WORST-CASE DISTANCE TO ENDPOINT

	Nominal Water Capacity[11] (Gallons)	Distance to Endpoint[12] (Miles)
Tank 1		
Tank 2		
Tank 3		
Tank 4		
Tank 5		
Tank 6		
Tank 7		
Tank 8		
Tank 9		
Tank 10		

Record the amount contained in your largest tank, remembering to adjust for administrative controls if you always fill your tanks to less than 88 percent capacity: _____ pounds. You have already calculated this in Chapter 1, Worksheet 1.

From Chapter 1

Record the distance to endpoint for your largest tank: _____miles.

Used Chapter 1

This is your "worst-case scenario.".

[11] Note: The Nominal Water Capacity information for each of your propane storage tanks can be transferred from Worksheet 1.

[12] Note: The Distance to Endpoint is found in Table 2.

ALTERNATIVE RELEASE SCENARIOS

Remember that alternative release scenarios are not required for Program 1 processes.

(a) The number of scenarios. The owner or operator shall identify and analyze at least one alternative release scenario . . . to represent all flammable substances held in the covered processes.
(b) Scenarios to consider.
(1) For each scenario required under paragraph (a) of this section, the owner or operator shall select a scenario:
(I) That is more likely to occur than the worst-case scenario under § 68.25; and
(ii) That will reach an endpoint offsite, unless no such scenario exists.

These are the only two criteria for selecting an alternative release scenario. The alternative release scenario gives you an opportunity to describe an event more likely than the worst-case scenario that may reach an endpoint offsite. This scenario will be of interest to many emergency responders. The alternative release scenario represents an event that an emergency responder may actually encounter as opposed to the worst-case event that has a very low probability of occurrence. Should you decide that no alternative scenario exists that would reach an endpoint offsite, you must document for your implementing agency the scenarios that you examined that allowed you to draw that conclusion, making sure you have reviewed all the possible release scenarios suggested below.

(2) Release scenarios considered should include, but are not limited to, the following, where applicable:
(I) Transfer hose releases due to splits or sudden hose uncoupling;
(ii) Process piping releases from failures at flanges, joints, welds, valves and valve seals, drains or bleeds;
(iii) Process vessel or pump releases due to cracks, seal failure, or drain, bleed, or plug failure;
(iv) Vessel overfilling and spill, or overpressurization and venting through relief valves or rupture disks; and
(v) Shipping container mishandling and breakage or puncturing leading to a spill.
(c) Parameters to be applied. The owner or operator shall use the appropriate parameters defined in § 68.22 to determine the distance to the endpoints. . .
(d) Consideration of mitigation. Active and passive mitigation systems may be considered provided they are capable of withstanding the event that triggered the release and would still be functional.
(e) Factors in selecting scenarios. The owner or operator shall consider the following in selecting alternative release scenarios:
(1) The five-year accident history provided in § 68.42; and
(2) Failure scenarios identified under §§ 68.50 or 68.67.

You should review your five-accident history as a guide to selecting an alternative scenario appropriate to your facility. It may also be possible to obtain information concerning propane accidents from EPA's web site, which has links to various accident databases.

Select one or more alternative release scenarios from Appendix 2A that is appropriate for your propane storage facility. Your selection should:

- ✦ Describe something that has occurred or could occur. Review any applicable accident history.
- ✦ Be more likely to occur than the worst-case scenario.
- ✦ Have a distance to the endpoint that is greater than the distance to the facility boundary, unless no such scenario exists.

Use the following worksheet to record the scenarios that you have selected from Appendix 2A.

WORKSHEET 3
POTENTIAL ALTERNATIVE RELEASE SCENARIOS

Alternative Flammable Release Scenario (Possible Selections)	Amount Released (pounds)	Distance to Endpoint (Miles)	Check the Scenario that You will Report as the Alternative Scenario
Pull Away			☐
Process Piping Breaks			☐
Overfilling Storage Tank Relief Valve Lifts			☐
Other: (Describe:)			☐

Alternative release scenarios will help stimulate discussions between the facility, the public and emergency planners. Emergency planners using information from the facility will decide how best to incorporate the distance to the endpoint into the community plan.

You can use other more sophisticated calculations and computer models to determine other scenarios or fire events and to determine other impact distances. The owner/operator attempting to provide more information to emergency planners should see the procedure in EPA's OCA Guidance for help in conducting these analyses. You also have the option of using other modeling to perform these analyses.

DEFINING OFFSITE IMPACTS

(a) The owner or operator shall estimate in the RMP the population within a circle with its center at the point of release and a radius determined by the distance to the endpoint defined in § 68.22(a).
(b) Population to be defined. Population shall include residential population. The presence of institutions (schools, hospitals, prisons), parks and recreational areas, and major commercial, office, and industrial buildings shall be noted in the RMP.
(c) Data sources acceptable. The owner or operator may use the most recent Census data, or other updated information, to estimate the population potentially affected.
(d) Level of accuracy. Population shall be estimated to two significant digits.

The rule requires that you estimate in the RMP residential populations within the circle defined by the endpoint for your worst-case and alternative release scenarios (i.e., the center of the circle is the point of release and the radius is the distance to the endpoint). In addition, you must report in the RMP whether certain types of public receptors and environmental receptors are within the circles.

RESIDENTIAL POPULATIONS

To estimate residential populations, you may use the most recent Census data or any other source of data that you believe is more accurate. You are not required to update Census data or conduct any surveys to develop your estimates. Census data are available in public libraries and in the LandView system, which is available on CD-ROM (see box below). The rule requires that you estimate populations to two-significant digits. For example, if there are 1,260 people within the circle, you may report 1,300 people. If the number of people is between 10 and 100, estimate to the nearest 10. If the number of people is less than 10, provide the actual number.

Census data are presented by Census tract. If your circle covers only a portion of the tract, you should develop an estimate for that portion. The easiest way to do this is to determine the population density per square mile (total population of the Census tract divided by the number of square miles in the tract) and apply that density figure to the number of square miles within your circle. Because there is likely to be considerable variation in actual densities within a Census tract, this number will be approximate. The rule, however, does not require you to correct the number.

OTHER PUBLIC RECEPTORS

Other public receptors must be noted in the RMP (see the discussion of public receptors in Chapter 2). If there are any schools, residences, hospitals, prisons, public recreational areas or arenas, or commercial or industrial areas within the circle, you must report that. You are not required to develop a list of all public receptors; you must simply check off that one or more such areas is within the circle. Most receptors can be identified from local street maps.

ENVIRONMENTAL RECEPTORS

Environmental receptors are defined as natural areas such as national or state parks, forests, or monuments; officially designated wildlife sanctuaries, preserves, refuges, or areas; and Federal

wilderness areas. Only environmental receptors that can be identified on local U.S. Geological Survey (USGS) maps (see box below) need to be considered. You are not required to locate each of these specifically. You are only required to check off in the RMP which specific types of areas are within the circle. If any part of one of these receptors is within your circle, you must note that in the RMP.

Important: The rule does not require you to assess the likelihood, type, or severity of potential impacts on either public or environmental receptors. Identifying them as within the circle simply indicates that they could be adversely affected by the release.

HOW TO OBTAIN CENSUS DATA AND LANDVIEW®

Census data can be found in publications of the Bureau of the Census, available in public libraries, including *County and City Data Book*.

LandView ®III is a desktop mapping system that includes database extracts from EPA, the Bureau of the Census, the U.S. Geological Survey, the Nuclear Regulatory Commission, the Department of Transportation, and the Federal Emergency Management Agency. These databases are presented in a geographic context on maps that show jurisdictional boundaries, detailed networks of roads, rivers, and railroads, census block group and tract polygons, schools, hospitals, churches, cemeteries, airports, dams, and other landmark features.

CD-ROM for IBM-compatible PCS
CD-TGR95-LV3-KIT $99 per disc (by region) or $549 for 11 disc set

U.S. Department of Commerce
Bureau of the Census
P.O. Box 277943
Atlanta, GA 30384-7943
Phone: 301-457-4100 (Customer Services -- orders)
Fax: (888) 249-7295 (toll-free)
Fax: (301) 457-3842 (local)
Phone: (301) 457-1128 (Geography Staff -- content)
http://www.census.gov/ftp/pub/geo/www/tiger/

Further information on LandView and other sources of Census data is available at the Bureau of the Census web site at www.census.gov.

HOW TO OBTAIN USGS MAPS

The production of digital cartographic data and graphic maps comprises the largest component of the USGS National Mapping Program. The USGS's most familiar product is the 1:24,000-scale Topographic Quadrangle Map. This is the primary scale of data produced, and depicts greater detail for a smaller area than intermediate-scale (1:50,000 and 1:100,000) and small-scale (1:250,000, 1:2,000,000 or smaller) products, which show selectively less detail for larger areas.

U.S. Geological Survey
508 National Center
12201 Sunrise Valley Drive
Reston, VA 20192
www.mapping.usgs.gov/

To order USGS maps by fa×, select, print, and complete one of the online forms and fax to 303-202-4693. A list of commercial dealers also is available at www.mapping.usgs.gov/esic/usimage/dealers.html/. For more information or ordering assistance, call 1-800-HELP-MAP, or write:

USGS Information Services
Box 25286
Denver, CO 80225

For additional information, contact any USGS Earth Science Information Center or call 1-800-USA-MAPS.

REVIEW AND UPDATE

(a) The owner or operator shall review and update the offsite consequence analyses at least once every five years.

To demonstrate that an offsite consequence analysis has been reviewed and updated, you must retain the last copy and date each subsequent analysis.

(b) If changes in processes, quantities stored or handled, or any other aspect of the stationary source might reasonably be expected to increase or decrease the distance to the endpoint by a factor of two or more, the owner or operator shall complete a revised analysis within six months of the change and submit a revised risk management plan as provided in § 68.190.

If you add or remove bulk storage tanks, you may have to re-do the offsite consequence analysis. If, as the result of adding a new tank, the distance to the endpoint for your worst-case analysis is more than twice as far as the previously reported distance, you must resubmit a revised risk management

plan within six months. Or if you remove your largest tank from service and the next largest tank has a distance to endpoint less than half of the original analysis, you must resubmit a revised risk management plan within six months. See Chapter 6 of this guidance for details on the risk management plan.

Increasing tank size will not proportionately increase your distance to endpoint. As Table 3 indicates, you would have to increase or decrease your tank size by more than a factor of five to double the distance. For example, if you replaced your 12,000 gallon tank (distance to endpoint = 0.3 miles) with a 100,000 gallon tank (distance to endpoint = 0.6 miles), you would be required to file an amended risk management plan. If you added five 30,000 gallon tanks, you would not have to file an amended plan because your distance to endpoint would only increase from 0.3 miles to 0.4 miles. Remember, worst case is the loss of the single largest vessel; adding storage capacity by adding more tanks of the same size will not alter the distance to an endpoint.

APPENDIX 2A - RELEASE CALCULATIONS

The endpoints that can be considered for the alternative release scenario are explosion damage, radiant heat effect and lower flammability limit vapor concentration. Review these potential alternative scenarios and pick one or more that best describes a scenario that is more likely to occur than the worst-case scenario and that has an endpoint which is beyond your facility boundary. The following are possible alternative release scenarios that use a vapor cloud explosion and an overpressure of 1 psi.

PULL-AWAY: (ACTIVE MITIGATION DEVICES PERFORM AS DESIGNED)[13]

An alternative scenario for a propane storage facility may be a hose rupture caused by a pull-away. A pull-away can occur if the driver fails to remove the hoses between the storage tank and the transfer vehicle (bobtail or transport) before moving the vehicle. In this case, the analysis considers the failure of a 25 foot length of unloading hose, 4" in diameter. The active mitigation devices are assumed to work as designed, limiting the release to the contents of the hose.

Volume of hose = cross sectional area of hose x length of hose
Volume of hose = $\pi \times (4 \text{ in} / 2)^2 \times 1 \text{ ft}^2 / 144 \text{ in}^2 \times 25 \text{ ft} = 2.182 \text{ ft}^3$
$W_f = 2.182 \text{ ft}^3 \times .504 \times 62.37$ pounds/ft3 = 68.59 pounds of propane

There are three methods described in EPA's OCA that you can use to determine the distance to the endpoint for an alternative scenario. Two of those methods are used here as an example.

PULL-AWAY EXPLOSION

You can use equation C-1 from EPA's OCA to calculate the distance exposed to greater than 1 psi overpressure. This method results in a distance to endpoint of 175 feet and the endpoint is 1 psi overpressure.
$D = 17 (0.1 \times W_f \times HC_f / HC_{TNT})^{⅓}$

Where,
W_f is the weight of propane in kilograms in the vapor cloud,
HC_f is the heat of combustion of propane from Appendix C of EPA's OCA,
HC_{TNT} is the heat of combustion of TNT from Appendix C of EPA's OCA, and
D is the distance in meters from the explosion where overpressure exceeds 1 psi.

$D = 17 (.1 \times Wf \times 46333/4680)^{⅓} = 17 (.1 \times 68.6/2.2046 \times 46333/4680)^{⅓} = 53.29$ meters =
D = 174.8 feet

[13] These valves require a pressure of 100 psi to function properly. The vapor pressure of propane at 60 °F is approximately 100 psi. At temperatures less than 60 °F, there may not be enough pressure to allow the valves to function properly. Since the excess safety valve may not function properly under some conditions, it may be more appropriate not to consider this mitigation device.

If you use this scenario as your alternative release scenario, the distance to endpoint is 175 feet and the endpoint used is 1 psi overpressure.

PROCESS PIPING BREAKS

Liquid propane pipe failures: ½", 1", 2", 3", 4" and 6". (Causes: liquid expansion [failure of hydrostatic valves], a pull-away [failure of breakaway devices[14]], collision, corrosion.) For long pipes, where the length to diameter ratio is significantly greater than one, flashing (i.e., conversion of gaseous propane to liquid) in the discharge pipe results in a two-phase release. You can estimate the amount released from a line shear using the following equation:

$$QR = 0.0853 \times HA \times F \times L / [V_{gl} \times (T \times C_p)^{0.5}]$$

Where: QR is the release rate in pounds per minute.
HA is the cross-sectional area of the pipe in square inches.
F is the frictional factor, which is 0.85 for pipe with a length to diameter ratio of 50.
L is the heat of vaporization, which is 426,000 joules per kilogram for propane.
V_{gl} is the specific volume of gas minus liquid in m^3/kg, which is 0.056 for propane.
T is the temperature in Kelvins (assumed to be 298).
C_p is the heat capacity, which is 2,400 joules/kilogram/Kelvin for propane.
0.0853 is a units conversion factor.

QR can be calculated using the values in the table below for HA. Now Q (the release quantity) can be calculated for a 10-minute release, and D (the distance to the endpoint in feet) can be calculated using equation C-1 from EPA's OCA. Note that Q cannot be larger than the amount of propane contained in your storage tank (this should be considered especially for 6" pipes).

For a 1" pipe:

QR = 512.5 pounds per minute

$Q = QR \times 10$ minutes = 5,125 total pounds released ($Q = W_f$)

$$D = 17 (0.1 \times W_f \times HC_f / HC_{TNT})^{⅓} = 17 \times (0.1 \times 5{,}125 / 2.2046 \times 46333 / 4680)^{⅓} = 224$$

D = 224 meters = 735 feet = 0.1 mile

If you use this scenario as your alternative release scenario, the distance to endpoint is 735 feet (or about 0.1 mile) and the endpoint used is 1 psi overpressure.

[14] See NFPA 58, 1998 Edition, Section 3-9.4.2. A breakaway device is used when dispensing LPG. It is designed so that the breakaway device fails (instead of the piping or hose) allowing other safety devices to retain the fuel and limit the spill. Failure of the breakaway device means that the breakage occurs somewhere else rather than at the breakaway device during a pull away, thus negating the effectiveness of some or all of the other safety devices.

TABLE 4
POTENTIAL DISTANCES TO ENDPOINT FOR PIPE RELEASES
(for 1 psi Overpressure)

Pipe Size (inches)	HA (inches^2)	QR (pounds/minute)	Q Total Amount Released after 10 minutes (pounds)	D (Miles)
0.50	0.20	128	1,281	0.1
1	0.79	512	5,125	0.1
2	3.14	2,050	20,499	0.2
3	7.07	4,612	46,122	0.3
4	12.57	8,199	81,995	0.4
6	28.27	18,449	184,488	0.5

OVERFILL STORAGE TANK - RELIEF VALVE LIFTS

A safety relief valve lifts (causes: overpressure or overfilling [failure of your level indicator and administrative procedures]).

A four-valve multiport relief valve has a flow capacity of 27,750 SCFM/Air at 300 psi with three of the four valves lifting. Estimate the amount of propane discharged from one port over 5 minutes and the distance to endpoint if the vapor cloud finds a source of ignition and explodes. The density of air is 12.39 ft^3/lb and the density of propane is 8.66 ft^3/lb. To convert $SCFM_{(air)}$ to $SCFM_{(propane)}$ multiply by 0.808.

The release rate from one port is 27,950 $SCFM_{(air)}$/ 3 = 9,250 SCFM (air)

$Q_{(propane)} = Q_{(air)} \times 0.808 / 8.66\ ft^3/lb = 863\ lbs/min \times 5\ min = 4{,}315lbs = 1957.4\ kg$

$D = 17 (0.10 \times 1957.4 \times 46{,}333/4680)^{1/3} = 211.9$ meters × 3.281 ft/meter = 695.2ft / 5280ft/mile = 0.13 miles.

TABLE 5
RELIEF VALVE DISCHARGES (FOR 1 PSI OVERPRESSURE)

Relief Valve Size (inches)	Capacity SCFM of Air	Release Rate (lbs/min) Propane	Duration (min)	Amount Released (lbs)	Distance to Endpoint (Miles)
Multiport 2½"	9,250	863	5	4,315	0.1
Dual Port 1¼"	5,250	490	5	2,449	0.08
2½"	10,390	969	5	4,847	0.1
1½"	6,080	567	5	2,836	0.1
1¼"	5,280	492	5	2,463	0.1
1 "	3,340	312	5	1,558	0.09

CHAPTER 3: FIVE-YEAR ACCIDENT HISTORY

The five-year accident history involves an examination of the effects of any accidental releases of one or more of the regulated substances from a covered process in the five years prior to the submission of a Risk Management Plan (RMP). A five-year accident history must be completed for each covered process, including the processes in Program 1, and all accidental releases meeting specified criteria must be reported in the RMP for the process.

Note that a Program 1 process may have had an accidental release that must be included in the five-year accident history, even though the release does not disqualify the process from Program 1. The accident history criteria that make a process ineligible for Program 1 (certain offsite impacts) do not include other types of effects that require inclusion of a release in the five-year accident history (on-site impacts and more inclusive offsite impacts). For example, an accidental release may have led to worker injuries, but no other effects. This release would not bar the process from Program 1 (because the injuries were not offsite), but would need to be reported in the five-year accident history. Similarly, a release may have resulted in damage to foliage offsite (environmental damage), triggering reporting, but because the foliage was not part of an environmental receptor (e.g., national park or forest) it would not make the process ineligible for Program 1.

WHAT ACCIDENTS MUST BE REPORTED?

The five-year accident history covers only certain releases:

- The release must be from a covered process and involve a regulated substance held above its threshold quantity in the process.

- The release must have caused at least one of the following:

  - On-site deaths, injuries, or significant property damage (§68.42(a)); or
  - Known offsite deaths, injuries, property damage, environmental damage, evacuations, or sheltering in place (§68.42(a)).

If you have had a release of a regulated substance from a process where the regulated substance is held below its threshold quantity, you do not need to report that release even if the release caused one of the listed impacts or if the process is covered for some other substance. You may choose to report the release in the five-year accident history, but you are not required to do so.

WHAT DATA MUST BE PROVIDED?

The following information should be included in your accident history for every reported release. The descriptions below are those used for the RMP*Submit system and data element instructions:

Date. Indicate the date on which the accidental release began.

Time. Indicate the time the release began.

Release duration. Indicate the approximate length of time of the release in minutes.

Chemical(s). Indicate the regulated substance(s) released. Use the name of the substance as listed in § 68.130 rather than a synonym (e.g., propane rather than LPG). If non-regulated substances were also released and contributed to the impacts, you may want to list them as well, but you are not required to do so.

Quantity released. Estimate the amount of each substance released in pounds. The amount should be estimated to two significant digits, or as close to that as possible. For example, if you estimate that the release was between 850 and 900 pounds, provide a best guess. We realize that you may not know precise quantities. For flammable mixtures, you may report the quantity of the mixture, rather than that of the individual regulated substances.

Release event. Indicate which of the following release events best describes your accident. Check all that apply:

- ✦ *Gas Release.* A gas release is a release of the substance as a gas (rather than vaporized from a liquid). If you hold a gas liquefied under refrigeration, report the release as a liquid spill.

- ✦ *Liquid Spill/ Evaporation.* A liquid spill/evaporation is a release of the substance in a liquid state with subsequent vaporization.

- ✦ *Fire.* A fire is combustion producing light, flames, and heat.

- ✦ *Explosion.* An explosion is a rapid chemical reaction with the production of noise, heat, and violent expansion of gases.

Release source. Indicate all that apply.

- ✦ *Storage Vessel.* A storage vessel is a container for storing or holding gas or liquid. Storage vessels include transportation containers being used for on-site storage.

- ✦ *Piping.* Piping refers to a system of tubular structures or pipes used to carry a fluid or gas.

- ✦ *Process Vessel.* A process vessel is a container in which substances under certain conditions (e.g., temperature, pressure) participate in a process (e.g., substances are manufactured, blended to form a mixture, reacted to convert them into some other final product or form, or heated to purify).

- ✦ *Transfer Hose.* A transfer hose is a tubular structure used to connect, often temporarily, two or more vessels.

- *Valve*. A valve is a device used to regulate the flow in piping systems or machinery. Relief valves and rupture disks open to release pressure in vessels.

- *Pump*. A pump is a device that raises, transfers, or compresses fluids or that attenuates gases by suction or pressure or both.

- *Joint*. The surface at which two or more mechanical components are united.

- *Other*. Specify other source of the release.

Weather conditions at time of event (if known). This information is important to those concerned with assessing and modeling the effects of accidents. Reliable information from those involved in the incident or from an on-site weather station is ideal. However, this rule does not require your facility to have a weather station. If you do not have an onsite weather station, use information from your local weather station, airport, or other source of meteorological data. Historical wind speed and temperature data (but not stability data) can be obtained from the National Climatic Data Center (NCDC) at (828) 271-4800; NCDC staff can also provide information on the nearest weather station. To the extent possible, complete the following:

- *Wind Speed and Direction*. Wind speed is an estimate of how fast the wind is traveling. Indicate the speed in miles per hour. Wind direction is the direction from which the wind comes. For example, a wind that blows from east to west would be described as having an eastern wind direction. You may describe wind direction as a standard compass reading such as "Northeast" or "South-southwest."

  You may also describe wind direction in degrees — with North as zero degrees and East as 90 degrees. Thus, northeast would represent 45 degrees and south-southwest would represent 202.5 degrees. Abbreviations for the wind direction such as NE (for northeast) and SSW (for south-southwest) are also acceptable.

- *Temperature*. The ambient temperature at the scene of the accident in degrees Fahrenheit. If you did not keep a record, you can use the high (for daytime releases) or low (for nighttime releases) for the day of the release. Local papers publish these data.

- *Stability Class*. Depending on the amount of incoming solar radiation as well as other factors, the atmosphere may be more or less turbulent at any given time. Meteorologists have defined six atmospheric stability classes, each representing a different degree of turbulence in the atmosphere. When moderate to strong incoming solar radiation heats air near the ground, causing it to rise and generating large eddies, the atmosphere is considered unstable, or relatively turbulent. Unstable conditions are associated with stability classes A and B. When solar radiation is relatively weak, air near the surface has less of a tendency to rise and less turbulence develops. In this case, the atmosphere is considered stable or less turbulent with weak winds. The stability class is E or F. Stability classes D and C represent conditions of neutral stability or moderate turbulence respectively. Neutral conditions are associated with relatively strong wind speeds and moderate solar radiation. The neutral

category D should be used, regardless of wind speed, for overcast conditions day or night, and for any sky conditions during the hour preceding or following the night. Exhibit 2 presents the stability classes associated with wind speeds, time of day, and cloud cover.

EXHIBIT 2
ATMOSPHERIC STABILITY CLASSES

SURFACE WIND SPEED AT 10 METERS ABOVE GROUND		DAY			NIGHT†	
Meters per second	Miles per hour	Incoming Solar Radiation			Thinly Overcast or ≥ 4/8 low cloud	≤ 3/8 Cloud
		Strong*	Moderate	Slight**		
< 2	<4.5	A	A-B	B		
2-3	4.5-7	A-B	B	C	E	F
3-5	7-11	B	B-C	C	D	E
5-6	11-13	C	C-D	D	D	D
>6	>13	C	D	D	D	D

† Night refers to one hour before sunset to one hour after dawn.
* Sun high in the sky with no clouds.
** Sun low in the sky with no clouds.

✦ *Precipitation Present.* Precipitation may take the form of hail, mist, rain, sleet, or snow. Indicate "yes" or "no" based on whether there was any precipitation at the time of the accident.

✦ *Unknown.* If you have no record for some or all of the weather data, indicate "unknown" for any missing item. We realize that you may not have weather data for accidents that occurred in the past. You should, however, collect these data for any future accidents.

On-site impacts. Complete the following about on-site effects.

✦ *Deaths.* Indicate the number of on-site deaths that are attributed to the accident or mitigation activities. On-site deaths means the number of employees, contract employees, offsite responders, or others (e.g., visitors) who were killed by direct exposure to toxic concentrations, radiant heat, or overpressures from accidental releases or from indirect consequences of a vapor cloud explosion from an accidental release (e.g., flying glass,

debris, other projectiles). You should list employee/contractor, offsite responder, and other on-site deaths separately.

- *Injuries.* An injury is any effect that results either from direct exposure to toxic concentrations, radiant heat, or overpressures from accidental releases or from indirect consequences of a vapor cloud explosion (e.g., flying glass, debris, other projectiles) from an accidental release and that requires medical treatment or hospitalization. You should list injuries to employees and contractors, offsite responders, and others separately.

  Medical treatment means treatment, other than first aid, administered by a physician or registered professional personnel under standing orders from a physician.

  Your OSHA occupational injury and illness log (200 Log) will help complete these items for employees.

- *Property Damage*. Estimate the value of the equipment or business structures (for your business alone) that were damaged by the accident or mitigation activities. Record the value in American dollars. Insurance claims may provide this information. Do **not** include any losses that you may have incurred as a result of business interruption.

Known offsite impacts. These are impacts that you know or could reasonably be expected to know of (e.g., from media reports or from reports to your facility) that occurred as a result of the accidental release. You are not required to conduct an additional investigation to determine offsite impacts.

Q & A
PROPERTY DAMAGE

Q. What level of offsite property damage triggers reporting?

A. Any level of known offsite property damage triggers inclusion of the accident in the five-year accident history. You are not required to conduct a survey to determine if such damage occurred, but if you know, or could reasonably be expected to know (e.g., because of reporting in the newspapers), that damage occurred, you must include the accident.

- *Deaths*. Indicate the number of offsite deaths that are attributable to the accident or mitigation activities. Offsite deaths means the number of people offsite who were killed by direct exposure to toxic concentrations, radiant heat, or overpressures from accidental releases or from indirect consequences of a vapor cloud explosion from an accidental release (e.g., flying glass, debris, other projectiles).

- *Injuries.* Indicate the number of injuries among people offsite. Injury means any effect that results either from direct exposure to toxic concentrations, radiant heat, or overpressures from accidental releases or from indirect consequences of a vapor cloud explosion from an

accidental release (e.g., flying glass, debris, other projectiles) and that requires medical treatment or hospitalization.

- *Evacuated.* Estimate the number of people offsite who were evacuated to reduce exposure that might have resulted from the accident. A total count of the number of people evacuated is preferable to the number of houses evacuated. People who were ordered to move simply to improve access to the site for emergency vehicles are not considered to have been evacuated.

- *Sheltered.* Estimate the number of people offsite who were sheltered-in-place during the accident. Sheltering-in-place occurs when community members are ordered to remain inside their residence or place of work until the emergency is over to reduce exposure to the effects of the accidental release. Usually these orders are communicated by an emergency broadcast or similar method of mass notification by response agencies.

- *Environmental Damage.* Indicate whether any environmental damage occurred and specify the type. The damage to be reported is not limited to environmental receptors listed in the rule. Any damage to the environment (e.g., dead or injured animals, defoliation, water contamination) should be identified. You are **not**, however, required to conduct surveys to determine whether such impact occurred. Types of environmental damage include:

  - Fish or animal kills.
  - Lawn, shrub, or crop damage minor defoliation.
  - Lawn, shrub, or crop damage major defoliation.
  - Water contamination.
  - Other (specify).

Initiating event. Indicate the initiating event that was the immediate cause of the accident, if known. If you conducted an investigation of the release, you should have identified the initiating event.

Equipment Failure. A device or piece of equipment failed or did not function as designed. For example, the vessel wall corroded or cracked.

- *Human Error.* An operator performed a task improperly, either by failing to take the necessary steps or by taking the wrong steps.

- *Weather Conditions.* Weather conditions, such as lightning, hail, ice storms, tornados, hurricanes, floods, earthquakes, or high winds, caused the accident.

- *Unknown.*

Contributing factors. These are factors that contributed to the accident, but were not the initiating event. If you conducted an investigation of the release, you may have identified factors that led to the initiating event or contributed to the severity of the release. Indicate all that apply.

- *Equipment Failure.* A device or piece of equipment failed to function as designed, thereby allowing a substance leading to or worsening the accidental release.

- *Human error.* An operator performed an operation improperly or made a mistake lead to or worsened the accident.

- *Improper Procedures.* The procedure did not reflect the proper method of operation, the procedure omitted steps that affected the accident, or the procedure was written in a manner that allowed for misinterpretation of the instructions.

- *Overpressurization.* The process was operated at pressures exceeding the design working pressure.

- *Upset Condition.* Incorrect process conditions (e.g., increased temperature or pressure) contributed to the release.

- *By-pass Condition.* A failure occurred in a pipe, channel, or valve that diverts fluid flow from the main pathway when design process or storage conditions are exceeded (e.g., overpressure). By-pass conditions may be designed to release the substance to restore acceptable process or storage conditions and prevent more severe consequences (e.g., explosion).

- *Maintenance Activity/ Inactivity.* A failure occurred because of maintenance activity or inactivity. For example, the storage racks remained unpainted for so long that corrosion caused the metal to fail.

- *Process Design.* A failure resulted from an inherent flaw in the design of the process (e.g., pressure needed to make product exceeds the design pressure of the vessel).

- *Unsuitable Equipment*. The equipment used was incorrect for the process. For example, the forklift was too large for the corridors.

- *Unusual Weather Conditions.* Weather conditions, such as lightning, hail, ice storms, tornados, hurricanes, floods, earthquakes, or high winds contributed to the accident.

- *Management Error.* A failure occurred because management did not exercise its managerial control to prevent the accident from occurring. This is usually used to describe faulty procedures, inadequate training, inadequate oversight, or failure to follow existing administrative procedures.

Whether offsite responders were notified. If known, indicate whether response agencies (e.g., police, fire, medical services) were contacted.

Changes introduced as a result of the accident. Indicate any measures that you have taken at the facility to prevent recurrence of the accident. Indicate all that apply.

- *Improved/ Upgraded Equipment.* A device or piece of equipment that did not function as designed was repaired or replaced.

- *Revised Maintenance.* Maintenance procedures were clarified or changed to ensure appropriate and timely maintenance including inspection and testing (e.g., increasing the frequency of inspection or adding a testing method).

- *Revised Training.* Training programs were clarified or changed to ensure that employees and contract employees are aware of and are practicing correct safety and administrative procedures.

- *Revised Operating Procedures.* Operating procedures were clarified or changed to ensure that employees and contract employees are trained on appropriate operating procedures.

- *New Process Controls.* New process designs and controls were installed to correct problems and prevent recurrence of an accidental release.

- *New Mitigation Systems.* New mitigation systems were initiated to limit the severity of accidental releases.

- *Revised Emergency Response Plan.* The emergency response plan was revised.

- *Changed Process.* Process was altered to reduce the risk (e.g., process chemistry was changed).

- *Reduced Inventory.* Inventory was reduced at the facility to reduce the potential release quantities and the magnitude of the hazard.

- *Other.*

- *None.* No changes initiated at facility as a result of the accident (e.g., because none were necessary or technically feasible). There may be some accidents that could not have been prevented because they were caused by events that are too rare to merit additional steps. For example, if a tornado hit your facility and you are located in an area where tornados are very rare, it may not be reasonable to design a "tornado proof" process even if it is technically feasible.

PART 68 INCIDENT INVESTIGATION

An incident investigation is a requirement of the rule (§§ 68.60 and 68.81). These requirements are virtually identical to the requirements under OSHA PSM. For accidents involving processes categorized in Program 2 or Program 3, you must investigate each incident which resulted in, or could reasonably have resulted in, a catastrophic release of a regulated substance. A report, which includes the following information, should be prepared at the conclusion of the investigation:

- Date of incident
- Date investigation began
- Description of the incident
- Factors that contributed to the incident
- Any recommendations resulting from the investigation.

Because the incident investigation report must be retained for five years, you will have a record for completing the five-year accident history for updates of the RMP.

CHAPTER 4: MANAGEMENT

68.15 Management (Only for Program 2 and Program 3; for Program 1, go to Chapter 7.

(a) The owner or operator of a stationary source with processes subject to Program 2 or Program 3 shall develop a management system to oversee the implementation of the risk management program elements.

(b) The owner or operator shall assign a qualified person or position that has the overall responsibility for the development, implementation, and integration of the risk management program elements.

The owner or operator of this propane storage facility has assigned the following

qualified person,_____

or this qualified position, _____

the responsibility for the development, implementation, and integration of the risk management program elements.

(c) When responsibility for implementing individual requirements of this part is assigned to persons other than the person identified under paragraph (b) of this section, the names or positions of these people shall be documented and the lines of authority defined through an organization chart or similar document.

Any position indicated below must report to the person or position that has overall authority for the risk management program. This is the person or position that you identified above. You may decide that certain people will be responsible for development of the program and that other people will be responsible for day-to-day operation of the program. You must make sure that your team(s) are reflected in your management system and that they report to someone with overall authority. You may use reporting diagrams to describe the reporting relationships rather than the chart below. Remember, whichever documentation is used, it must be updated when personnel or position changes are made.

Completing Worksheet 4 will fulfill this responsibility:

WORKSHEET 4
MANAGEMENT SYSTEM

Risk Management Program Element	Person or Position Assigned Responsibility
Safety Information:	
Hazard Review:	
Operating Procedures:	
Training:	
Maintenance:	
Compliance Audits:	
Accident Investigation:	

CHAPTER 5: PROGRAM 2 PREVENTION PROGRAM

EPA developed the Program 2 prevention program by identifying the basic elements that are the foundation of sound prevention practices — safety information, hazard review, operating procedures, training, maintenance, compliance audits, and accident investigation. By meeting other Federal regulations, state laws, industry codes and standards, and good engineering practices, you probably have already met most of the Program 2 prevention elements requirements.

As important as each of the elements is, you will not gain the full benefit from them unless you integrate them into a risk management system that you implement on an on-going basis. For example, the hazard review must be built on the safety information; the results of the hazard review should be used to revise and update operating and maintenance procedures. Workers must be trained in these procedures and must use them every day.

There are seven elements in the Program 2 prevention program, which is set forth Subpart C of part 68. Exhibit 3 sets out each of the seven elements and corresponding section numbers.

You must integrate these seven elements into a risk management program that you and your staff implement on a daily basis. Understanding and managing risks must be part of the way you operate. Doing so will provide benefits beyond accident prevention. Preventive maintenance and routine inspections will reduce the number of equipment failures and down time; well-trained workers, aware of optimum operating parameters, will allow you to gain the most efficient use of your processes and raw materials.

EXHIBIT 3
SUMMARY OF PROGRAM 2 PREVENTION PROGRAM

Number	Section Title
§ 68.48	Safety Information
§ 68.50	Hazard Review
§ 68.52	Operating Procedures
§ 68.54	Training
§ 68.56	Maintenance
§ 68.58	Compliance Audits
§ 68.60	Incident Investigation

68.48 SAFETY INFORMATION

(a) The owner or operator shall compile and maintain the following up-to-date safety information related to the regulated substances, processes, and equipment:

Having up-to-date information about your process is the foundation of an effective accidental release prevention program. Many elements (especially the hazard review) depend on the accuracy and thoroughness of the information this element requires you to have.

(1) Material Safety Data Sheets [MSDSs] *that meet the requirements of 29 CFR 1910.1200(g);*

The purpose of this requirement is for you to document the hazardous characteristics of propane, so that you have the information to share with the community and your employees. An MSDS that is constructed in compliance with OSHA's 29 CFR 1910.1200(g) effectively documents such hazards. This is one part of OSHA's Hazard Communication Standard, and it is an example of the common sense approach EPA and OSHA bring to the accident release prevention programs. If you do not have an up-to-date MSDS for propane, you should request one from your propane supplier. Obtain an up-to-date MSDS for propane and file it with your other process safety information.

(2) Maximum intended inventory of equipment in which the regulated substances are stored or processed.

This is the total amount of propane (in pounds) which can be safely stored in your storage tanks. Chapter 1, Table 2, provides the maximum capacity of propane tanks at 60°F. The maximum intended inventory may be greater than your actual inventory if you limit the quantity you hold in a tank.

The maximum intended inventory of my propane distribution

facility is: _____ pounds.

From Chapter 1

This may be the total that you calculated for each vessel in each process on Worksheet 1 unless you limit the inventory.

(3) Safe upper and lower temperatures, pressures, flows, and compositions;

You need this information to understand the operating parameters for your facility. These ranges define the safe conditions under which you operate your propane storage facility. Excursions beyond these ranges represent abnormal conditions or upset conditions. You must first recognize what is considered normal operation, so that you can devise safety mechanisms to guide operator responses to abnormal situations. Many of these procedures have been developed by the National Propane Gas Association. Transfer the following information to your file of process safety information:

- Propane is a gas at normal temperatures and pressures. It is liquefied by storing it in a closed container at pressures higher than its equilibrium vapor pressure. There is a direct relationship between ambient temperature and the pressure inside the storage container. As the ambient temperature increases, the pressure of the container increases proportionately. According to NFPA 58, 1998 Edition, Table B-1.2.1, commercial propane when heated to a temperature of 105°F will produce a pressure of 210 pounds per square inch, gauge (psig). NFPA 58, 1998 Edition, Table 2-2.2.2 sets the current minimum design pressure for an ASME tank at 250 pounds per square inch, absolute (psia). This design allows for a maximum vapor pressure of 215 psia at 100°F. The discharge piping for pumps and compressors is currently designed to 350 psi and vapor piping is designed for 250 psi according to NFPA 58, 1998 Edition, 3-2.10.2. The minimum temperatures are determined by the steel used in design of storage tank and the piping. Liquid propane (if released at atmospheric pressure) can refrigerate steel pipes and tanks down to temperatures of -44°F.

- Another property of propane in its liquid form is its ability for the liquid to greatly expand when heated. Therefore, NFPA 58, 1998 Edition sets the maximum filling capacity of large tanks in Table 4-4.2.2(b) to avoid overfilling.

If you have a policy to only fill your propane storage tanks to a certain volume, put that policy in writing, and save it with this process safety information. Written procedures are considered to be administrative controls by EPA, and you can take credit for having written administrative procedures for certain parts of this rule.

(4) Equipment Specifications;

You must maintain equipment specifications for all equipment that is part of a covered process, including your bulk storage tank(s), piping, pressure relief valves, hydrostatic relief valves, emergency shutoff valves, temperature, pressure and level gauges, valves, pumps, compressors, and hoses. Specifications for your bulk, propane storage tank(s) are provided on the nameplate attached to the tank (refer to NPGA # 4200 CETP "Basic Principles and Practices"for more information)[15]. If you do not have the specifications for the other items, you can request it from your vendors. It is recommended that you file all the vendor specification information that you collect for your critical equipment in one place.

(5) Codes and standards used to design, build, and operate the process.

You must document the codes and standards you used to design and build your facility and that you follow to operate. These codes will probably include the electrical and building codes that you must comply with under state or local laws. Your equipment vendors will be able to provide you with information on the codes they comply with for their products.

Table 6 summarizes the process safety information for a typical propane storage facility to give you an idea of what may be expected.

[15] NPGA # 4200 Certified Employee Training Program, "Basic Principles and Practices" Section 1.3.

TABLE 6
PROCESS SAFETY INFORMATION

Example Process Safety Information: Propane Storage	
Item	**Description**
MSDS Propane	Dated 6/95
Maximum Intended Inventory	400,000 pounds
Nominal Water Capacity of Largest Tank	60,899 Gallons
Temperature	Upper: ambient max 110°F Lower: ambient min -15°F
Pressure	Upper: 240 PSI @ 110°F Lower: 35 PSI @ -15°F
Flow Rate	Loading: 100 GPM (max) Unloading: 265 GPM (max)
Vapor Piping	250 PSIG
Liquid Piping & Compressor Discharge	350 PSIG
Safety Relief Valves RV1 RV2 RV3 RV4	Each valve relieves 9,250 SCFM/air, three are required at all times a fourth is provided to allow maintenance Replaced 9/95 Replaced 7/96 Replaced 6/97 Installed 7/88 scheduled for replacement 7/98
Internal Valve	3", closes at 260 GPM with 100 PSIG inlet
Excess Flow Valve EFV1 EFV2 EFV3 EFV4	 3", closes at 225 GPM with 100 PSIG inlet 2", closes at 100 GPM with 100 PSIG inlet 2", closes at 34,500 SCFH with 100 PSIG inlet 1¼", closes at 10,000 SCFH with 100 PSIG inlet
Emergency Shutoff Valve ESV1 ESV2	 1¼", closes at 26,000 SCFH with 100 PSIG inlet 2", closes at 225 GPM with 100 PSIG inlet

Item	Description
Hydrostatic Relief Valve HSV1 HSV2 HSV3 HSV4 HSV5 HSV6	 ½", opens at 450 PSIG same same same same same
Pump 1	2"x 2" 75 GPM at 100 PSID
Pump 2	3"x 2" 100 GPM at 100 PSID
Compressor 1	Sz 490, 200 GPM at 250 PSI, 15 HP
Compressor 2	Sz 690, 265 GPM at 250 PSI, 20 HP
Vaporizer	Type: Direct Sz. 1.9 x 10^6 Btu/Hr Flow: 6,000 Gal/Hr
Strainer	3"
Check valves	1¼"
Sightflow Indicator	3", internal backcheck
Tank Level Indicator	10" Dial with internal float
Tank Temperature Indicator	-20-150°F, 6" dial
Tank Pressure Indicators	0-300 PSI, 8" dial
Other Temperature Indicators	0-200°F, 3½" dial
Other Pressure Indicators	0-300 PSI, 2"dial
Design Codes	
State or Local Codes	Plant Designed under NFPA 58-1985
Piping Design	ASME B31.3
Tank Design	ASME NB# 0012 State ID # 324576
Vaporizer Design	ASME NB # 4900 State ID # 123456
Date of Most Recent Revision	**Revised by:**
8/31/98	*John Smith*

The following worksheet has been provided to help you assemble your process safety information.

WORKSHEET 5
PROCESS SAFETY INFORMATION

Process Safety Information Worksheet: Propane Storage	
Item	**Description**
MSDS Propane	
Maximum Intended Inventory	
Nominal Water Capacity of Largest Tank	
Temperature	Upper: Lower:
Pressure	Upper: Lower:
Flow Rate	Loading: Unloading:
Vapor Piping	
Liquid Piping	
Safety Relief Valves RV1 RV2 RV3 RV4	
Internal Valve	
Excess Flow Valve EFV1 EFV2 EFV3 EFV4	
Emergency Shutoff Valve ESV1 ESV2	

Item	Description
Hydrostatic Relief Valve HSV1 HSV2 HSV3 HSV4 HSV5 HSV6	
Pump 1	
Pump 2	
Compressor 1	
Compressor 2	
Vaporizer	Type: Sz. Flow:
Strainer	
Check valves	
Sightflow Indicator	
Tank Level Indicator	
Tank Temperature Indicator	
Tank Pressure Indicators	
Other Temperature Indicators	
Other Pressure Indicators	
Design Codes	
State or Local Codes	
Piping Design	
Tank Design	ASME NB# State ID#
Vaporizer Design	ASME NB# State ID#
Date of Most Recent Revision	**Revised By:**

After you have documented your safety information, you should double check it to be sure that the files you have reflect the equipment you are currently using. It is important to keep this information up-to-date. Whenever you replace equipment, be sure that you put the new equipment specifications in the file and consider whether any of your other prevention elements (e.g., operating procedures or operator training) need to be reviewed to reflect the new equipment.

(b) The owner or operator shall ensure that the process is designed in compliance with recognized and generally accepted good engineering practices. Compliance with Federal or state regulations that address industry-specific safe design or with industry-specific design codes and standards may be used to demonstrate compliance with this paragraph.

The Equipment specifications and lists of standards and codes will probably meet the final requirement, that you ensure that your process is designed in compliance with recognized and generally good engineering practices. If you have any doubt that you are not meeting this requirement, you should contact your trade association to determine if there are practices or standards that you are not aware of that may be useful in your operation.

The design code used to design, build and operate your propane storage facility will likely be the edition of NFPA 58 adopted by your state or local regulatory authority and in effect when your facility was built.

Good practice is to keep your facility up-to-date with the current edition of NFPA 58.

(c) The owner or operator shall update the safety information if a major change occurs that makes the information inaccurate.

Modification of facility may be governed by the appropriate edition of NFPA 58 as mandated by your state and local LP-Gas regulations. You must document the codes used to design any modifications to your facility. List each of the major changes that have occurred at your facility, the year that the change was installed, and the appropriate design code (the edition of NFPA 58 or the state or local code) used in the table below:

WORKSHEET 6
MAJOR CHANGES

Description of Major Change	Year Installed	Appropriate Design Code
Reviewed By:		Date:

This document has been designed using NFPA 58, 1998 Edition. Your state or local authorities may have approved earlier editions. You should be ready to explain any differences between your facility design and the current requirement of your state or local regulatory authority.

68.50 HAZARD REVIEW

(a) The owner or operator shall conduct a review of the hazards associated with the regulated substances, process, and procedures.

For a process eligible for Program 2, you do not have to perform a full Process Hazard Analysis (PHA) as required by OSHA's PSM standard, but you must conduct a hazard review. EPA has streamlined the PHA to create a requirement that will help you detect process hazards in your plant without being overly burdensome. The hazard review will help you determine whether you are meeting applicable codes and standards, identify and evaluate the types of potential failures, and focus your emergency response planning efforts.

The review shall identify the following:
(1) The hazards associated with the process and regulated substances;
(2) Opportunities for equipment malfunctions or human errors that could cause an accidental release;
(3) The safeguards used or needed to control the hazards or prevent equipment malfunction or human error; and
(4) Any steps used or needed to detect or monitor releases.

(b) The owner or operator may use checklists developed by persons or organizations knowledgeable about the process and equipment as a guide to conducting the review. For processes designed to meet industry standards or Federal or state design rules, the hazard review shall, by inspecting all equipment, determine whether the process is designed, fabricated and operated in accordance with the applicable standards or rules.

You can conduct the hazard review by completing the attached checklist while you are physically inspecting the equipment in your propane storage facility. The Checklist has been prepared based on the requirements of NFPA 58, 1998 Edition and supplemented with additional information from NPGA Safety Bulletin #106-83 "LP-Gas Bulk Storage Safety Inspection Checklist". If you use this checklist, you may have to modify it to address site-specific concerns. You must be sure that it addresses all of your potential problems. You may need to consider external events as well as internal failures. If you are in an area subject to earthquakes, hurricanes, or floods, you should examine whether your plant would survive these natural events without releasing the substance. You should consider the potential impacts of lightning strikes and power failures. If your equipment could be hit by vehicles, you should examine the consequences of that. If you have anything near the plant that could burn, ask yourself what would happen if the fire affected the plant.

(c) The owner or operator shall document the results of the review and ensure that problems identified are resolved in a timely manner.

(d) The review shall be updated at least once every five years. The owner or operator shall also conduct reviews whenever a major change in the process occurs; all issues identified in the review shall be resolved before startup of the changed process.

You must complete, update, and re-validate your hazard review according to the requirements and time-tables in the risk management program rule. You must re-validate your hazard review at least every five years.

PROPANE STORAGE FACILITY HAZARD REVIEW CHECKLIST[16,17]

Answer the questions below by indicating "Yes", "No" or "N/A" (for not applicable). "No" responses require further comment and a projected completion date for correcting the deficiency.

Siting	**Yes/No/NA**	**Comments**
1. Does the arrangement of your fixed storage tanks conform with the minimum distances allowed in Table 3-2.2.2 of NFPA 58, 1998 Edition?		
2. Are your fixed storage tanks separated from any oxygen or hydrogen storage by the minimum distances given in Table 3-2.2.7(f) of NFPA 58, 1998 Edition?		
3. Are your transfer points separated from the exposure points by the minimum distances given in Table 3-2.3.3 of NFPA 58, 1998 Edition?		
Piping, Equipment & Container Appurtenances	**Yes/No/NA**	**Comments**
1. Is your storage facility designed according to ASME code for pressure vessels? Fixed Storage Tanks ASME? Vaporizers ASME?		

[16] Completing the Propane Storage Facility Hazard Review Checklist does not guarantee that your facility is in complete compliance with NFPA 58, 1998 Edition.

[17] The Propane Storage Facility Hazard Review Checklist is based on NFPA 58, 1998 Edition. Over the years, various changes in NFPA 58 have been made to reduce the probability of a propane release. You should carefully review any change to NFPA 58 since your facility was constructed and consider appropriate changes to ensure the safety of your facility. Document the actions that you take. You should be ready to explain any differences between the version of NFPA 58 that you used to construct your facility and the current version.

Piping, Equipment & Container Appurtenances	Yes/No/NA	Comments
2. Is the pressure rating of your storage tanks appropriate for the product in service? Storage Tanks? Vaporizers?		
3. Is the stored product properly identified?		
4. On installations with multiple tanks, are the elevations of your storage tanks arranged to prevent unintentional overfilling of the lowest container?		
5. On installations with stairways or ladders, are they well anchored, supported and of slip proof construction?		
6. On installations with stairways or ladders, are railings provided and in good condition?		
7. On installations with stairways or ladders, are catwalks provided so personnel need not walk on any portion of the container?		
8. Is your piping designed according to NFPA 58, 1998 Edition, Section 3-2.10? Are your pump and compressor discharge and liquid transfer lines suitable for a working pressure of 350 psi? Is your vapor piping suitable for a working pressure of 250 psi? On installations with vaporizers, are your vaporizers designed according to 2-5.4.2 or 2-5.4.3 or 2-5.4.4 and 2-5.4.5 or 2-5.4.6 or 2-5.4.7 of NFPA 58, 1998 Edition?		
9. Is the relief capacity of your pressure relief devices: For fixed storage tanks, designed according to Sections 2-3.2 and 3-2.5 or 3-2.6 of NFPA 58, 1998 Edition? On installation with vaporizers, are your vaporizers designed according to 2-5.4.5 or 2-5.4.6 or 2-5.4.7 of NFPA 58, 1998 Edition?		

Piping, Equipment & Container Appurtenances	Yes/No/NA	Comments
10. Is the capacity of your pressure relief devices designed according to 2-3.2 and 3-2.5 or 3-2.6 of NFPA 58, 1998 Edition? Have your relief devices been tested or replaced every ten years according to the good practice recommended by Section E-2.3.2 of NFPA 58, 1998 Edition?		
11. Do you have appropriate level gauges, temperature indicators, and pressure gauges installed on your fixed ASME storage tanks as specified in 2-3.3.2(b), 2-3.3.3, 2.3.4, 2.3.5 of NFPA 58, 1998 Edition?		
12. Do you have the appropriate hydrostatic relief valves installed between every section of liquid piping which can be blocked by manual or automatic valves according to 2-4.7 and 3-2.11 of NFPA 58, 1998 Edition?		
13. Do you have the appropriate corrosion protection required by 3-2.14 of NFPA 58, 1998 Edition?		
14. On installations with pumps, are they installed according to 3-2.15.1 of NFPA 58, 1998 Edition? On installations with automatic bypass valves, are they installed on the discharge of your pump according to 3.2.15(b)1 and 2-5.2 of NFPA 58, 1998 Edition?		
15. On installations with compressors, are they installed according to 2-5.3 and 3-2.15.2 of NFPA 58, 1998 Edition? On installations with compressors, is there either an integral means of preventing liquid from entering the compressor or a liquid suction protection trap according to 3-2.15.2(b) of NFPA 58, 1998 Edition?		
16. Do your compressor and pump motors conform with 2-5.1.4 of NFPA 58, 1998 Edition?		
17. On installations with liquid strainers, are they installed on the suction of your pump or meter according to 3-2.15.3 and 2-5.5 of NFPA 58, 1998 Edition and capable of being cleaned?		
18. On installations with flexible connections on pumps, compressors or loading and unloading bulkheads, are they installed as specified by 2-4.6 of NFPA 58, 1998 Edition?		
19. Do you have either excess flow valves, backflow check valves or internal valves as specified by 2-3.3.3 and 3-3.3.7 of NFPA 58, 1998 Edition?		

Piping, Equipment & Container Appurtenances	Yes/No/NA	Comments
20. Do you have container appurtenance protection as specified in 2-3.7 of NFPA 58, 1998 Edition?		
21. Do you have manual valves and emergency shutoff valves as required by 2-4.5.4, 3-2.10.11, 3-3.3.7 and 3-3.3.8 of NFPA 58, 1998 Edition?		
22. On installations with vaporizing equipment, is it installed according to 2-5.4 and 3-6 of NFPA 58, 1998 Edition? Have the liquid traps, temperature controls, and interlocks been tested per the manufacturer's guidelines?		
23. On installations with regulators, are they installed according to 2-5.7 and 3-2.7 of NFPA 58, 1998 Edition?		
24. Do you have a breakaway stanchion as required by 3-9.4.2 of NFPA 58, 1998 Edition?		
25. On installations with swivel-type piping, are they installed as specified by 3-2.10.11(a) of NFPA 58, 1998 Edition?		
26. Are all above ground lines securely fastened to structural members of adequate strength and supported at proper intervals?		
27. Are pressure gauges located so that they will not be exposed to physical damage?		
28. Are there sufficient lines for all purposes, without improper dual use or make-shift connections being used for some operations?		
29. Are hoses the correct type for each use?		
30. Are hose couplings of the correct type and properly attached (fully seated on the hose)?		
31. Is adequate transfer hose storage provided?		
32. Are the written transfer, loading & unloading instructions available (see § 68.52 of this model program)?		

Human Factors	Yes/No/NA	Comments
1. Have your operators been trained on the written operating instructions for this propane storage facility (see § 68.54 of this model program)?		

Human Factors	Yes/No/NA	Comments
2. For operators on the job on or before June 21, 1999, do they have the required knowledge, skills and ability to perform their duties safely?		
3. Are your operators whose job duties require the use of the above listed equipment understand the operating limits of the system in regards to: Capacity? Pressure? Temperature? Adverse Weather or Natural Conditions?		
4. Have your operators been trained in the correct response to conditions which exceed the operating limits of the system?		
5. Have your operators been trained in their duties for emergency conditions? Fire? LP Gas Release? Severe Weather or Natural Conditions?		
6. Are the written operating instructions available to the operators (see § 68.52 of this model program)?		
7. Do the written operating instructions reflect current operation of the facility (see § 68.52 of this model program)?		
8. Have major modifications to your propane storage facility taken place (see § 68.48 of this model program)?		
9. Are contractors used at the facility?		
10. Are safe work practices such as lock/tag, hot work and line opening followed at the facility?		

Human Factors	Yes/No/NA	Comments
11. Is there a written emergency response plan (see Subpart E of this model program)? Is it current? Have your operators been trained? Do you provide emergency response equipment? Has it been checked?		

General Hazards	Yes/No/NA	Comments
1. Does your propane storage facility have protection against tampering as specified in under 3-3.6 of NFPA 58, 1998 Edition?		
2. Does your propane storage facility have lighting as specified in 3-3.7 of NFPA 58, 1998 Edition?		
3. Is the area around your containers and transfer piping free of all combustible material?		
4. Has a fire safety analysis been performed for your propane storage facility as suggested by 3-10.2.2 and 3-10.2.3 of NFPA 58, 1998 Edition?		
5. Has your fire safety analysis been reviewed by your local fire authority?		
6. Has your facility been required by your local fire authority to provide special protection? Fixed Water Sprays/Monitor Nozzles? Insulating Coatings? Mounding/Burial? Other types?		
7. Has a federal, state or local agency or fire authority required: Local Gas Detection Monitors? Perimeter Gas Monitors and Public Alarms?		

This Hazard Review was Completed by:	On (Date):

The latest date by which all changes resulting from the process hazard review are expected to be completed is _____.
Date

68.52 OPERATING PROCEDURES

(a) The owner or operator shall prepare written operating procedures that provide clear instructions or steps for safely conducting activities associated with each covered process consistent with the safety information for that process. Operating procedures or instructions provided by equipment manufacturers or developed by persons or organizations knowledgeable about the process and equipment may be used as a basis for the stationary source's operating procedures.

Written operating procedures describe the tasks your operators must perform, safe process operating parameters that must be maintained, and safety precautions for operations and maintenance activities. These procedures tell your employees how to work safely every day, giving everyone a quick source of information that can prevent or mitigate the effects of an accident, and providing workers and management with a standard against which to assess performance.

The National Propane Gas Association (NPGA) Certified Employee Training Program (CETP)[18] and NPGA Safety Bulletins[19] can be used to meet this requirement. Other training programs may be available that will also be acceptable.

The following Table 7 shows how this requirement can be satisfied using CETP and the NPGA Safety Bulletins. Other equivalent programs may be substituted in lieu of CETP and NPGA Safety Bulletins to satisfy this requirement.

(b) The procedures shall address the following:

[18] National Propane Gas Association, Certified Employee Training Program, 1600 Eisenhower Lane, Suite 100, Lisle, Illinois 60532. Telephone: (630) 515-0600.

[19] National Propane Gas Association, Safety Handbook, 1600 Eisenhower Lane, Suite 100, Lisle, Illinois 60532. Telephone: (630) 515-0600.

TABLE 7
OPERATING PROCEDURES REQUIREMENTS

Procedure Requirement		NPGA Certified Employee Training Program (CETP)		NPGA Bulletin	
(1)	*Initial Startup:*	Distribution Systems Operations	"Preparing Propane Storage Containers for Installation."		
		Distribution Systems Operations	"Identifying Procedures Used to Pressure Test and Leak Check New Propane Distribution Systems."		
(2)	*Normal Operations:*	Transfer Systems	"Identifying Propane Pumps and their Operation."		
		Transfer Systems	"Identifying Parts and Devices Basic to Compressors."		
		Plant Operations	"Filling Propane Storage Containers."		
		Plant Operations	"Unloading a Propane Transport."		
		Plant Operations	"Unloading a Propane Tank Car."		
		Propane Delivery	"Filling Cargo Tanks on Bulk Delivery Vehicles."		
(3)	*Temporary Operations:*	Plant Operations	"Removing Propane from Stationary ASME Tanks and DOT Cylinders."		
(4)	*Emergency Shutdown and Operation:*			200-89	How to Control LP-Gas Leaks & Fires
				202-81	What you should do in case of accidents involving LP-Gas

Procedure Requirement		NPGA Certified Employee Training Program (CETP)		NPGA Bulletin	
				202-93	Steps to Take in the Event of an Accident Involving Propane
				204-88	How to Handle LP-Gas Fires with Portable Fire Extinguisher
				206-91	Emergency Response Guidelines
				207-94	Guidelines for Developing Plant Emergency Procedures
				211-91	LP-Gas Fire Control and HAZ MAT Training Guide
(5)	*Normal* (Manual) *Shutdown:*				
(6)	*Startup following a normal or emergency shutdown or a major change that requires a hazard review: See item (1) above.*				
(7)	*Consequences of deviations and steps required to correct or avoid deviations.*				
(8)	*Equipment inspections.*				

(c) The owner or operator shall ensure that the operating procedures are updated, if necessary, whenever a major change occurs and prior to startup of the changed process.

68.54 TRAINING

(a) The owner or operator shall ensure that each employee presently operating a process, and each employee newly assigned to a covered process, have been trained or tested competent in the Operating Procedures provided in § 68.52 that pertain to their duties. For those employees already operating a process on June 21, 1999, the owner or operator may certify in writing that the employee has the required knowledge, skills and abilities to safely carry out the duties and responsibilities as provided in the operating procedures.

Training programs often provide immediate benefits because trained workers have fewer accidents, damage less equipment, and improve operational efficiency. Training gives workers the information they need to understand how to operate safely and why safe operations are necessary. A training program, including refresher training, is the key to ensuring that the rest of your prevention program is effective.

Complete the following to certify that employees operating a process on or before June 21, 1999, have the requisite knowledge, skills, and abilities to operate the process safely.

The following employees were already operating this propane storage facility on June 21, 1999. These employees have the required knowledge, skills, and abilities to safely carry out the duties and responsibilities as specified in the operating procedures.

WORKSHEET 7
EMPLOYEES WORKING PRIOR TO 6/21/99

Employee Name	Employee I.D. #

Certified by: _____ _____
Owner/Operator (signature) Date

You must train all new workers in the operating procedures you are using to comply with § 68.52. If any of your more experienced operators need training on these procedures, you should also train them. Any time the procedures are revised, you must train everyone on the changed procedures. At least once every three years, you must provide refresher training on the operating procedures even if they have not changed. The training must cover all parts of the operating procedures, including information on the consequences of deviations and steps needed to address deviations or upset conditions.

You are not required to provide a specific amount of training or type of training for the EPA Risk Management Program. You should develop a training approach that works for you. If you are a small facility, one-on-one training and on-the-job training may work best. Larger facilities may want to provide classroom training or video courses developed by vendors or trade associations. You may have senior operators present the training or use trainers provided by vendors or other outside sources. The form and length of the training will depend on your resources and the complexity of your processes. If you can teach someone the basics in two hours, that could be acceptable. The important thing is that your workers understand how to operate safely and carry out their tasks properly. We are interested in the results of the training, not the details of how you achieve them. Find a system that works for you.

You are also required to ensure that each worker trained has understood the training and is competent to operate the process safely. You may decide what kind or kinds of competency testing to use. Observation by a senior operator may be appropriate in many cases. If you provided classroom training, you may want to use both testing and demonstration or observation. You are required to report in the RMP on the type(s) of competency testing you use.

In the RMP, you are required to report on the date of the most recent review or revision of your training program. You are also required to report on the type of training required (e.g., classroom or on-the-job) and the type of competency testing used. You should keep on site any current training materials or schedules used. The rule does not require you to keep particular records of your training program. It is enough for you to have on site information that supports what is reported in the RMP and your implementation of the training program overall. You may want to keep an attendance log for any formal training courses and refresher training to ensure that everyone who needs to be trained is trained. Such logs will help you perform a compliance audit or demonstrate compliance with the rule although you are not required to keep logs for this rule.

The following training guidelines or recommended practices qualify as industry-specific standards and may be used in whole or in part to meet the training requirements. Select the appropriate training from the possibilities listed below (see § 68.52 of this model program for more information on the written procedures to be encompassed by the training program) and make any modifications necessary to tailor the program to your facility:

- ✦ All of the Operating Procedures listed in the Operating Procedure section of this guidance.
- ✦ Certified Employee Training Program (CETP) that includes the following modules.

    I. “Basic Principles and Practices.”

ii. "Propane Delivery."
iii. "Distribution System Operations."
iv. "Transfer Systems."
v. "Plant Operations."

- Other recognized training programs that address similar aspects of operating an LP Gas distribution facility which may or may not be required by the state or local authority having jurisdiction.

(b) Refresher Training. Refresher training shall be provided at least every three years, and more often if necessary, to each employee operating a process to ensure that the employee understands and adheres to the current operating procedures of the process. The owner or operator, in consultation with employees operating the process, shall determine the appropriate frequency of refresher training.

You must conduct refresher training at least once every three years. Make sure that your employees understand the training and are using your operating procedures. Talk with your operators to determine how often refresher training needs to be conducted. Remember, you must conduct refresher training at least once every three years.

(c) The owner or operator may use training conducted under Federal or state regulations or under industry-specific standards or codes or training conducted by covered process equipment vendors to demonstrate compliance with this section to the extent that the training meets the requirements of this section.

Do not forget that DOT 49 CFR 172.704(c)(2) requires refresher training every three years. The DOT training may be considered part of the training required to fulfill the refresher training requirement. Also remember that your particular state or local authority may have additional requirements for refresher training, which should be included in your overall training program.

(d) The owner or operator shall ensure that operators are trained in any updated or new procedures prior to startup of a process after a major change.

Most recent review of training program _____ on _____
Name Date

68.56 MAINTENANCE

(a) The owner or operator shall prepare and implement procedures to maintain the on- going mechanical integrity of the process equipment. The owner or operator may use procedures or instructions provided by covered process equipment vendors or procedures in Federal or state regulations or industry codes as the basis for stationary source maintenance procedures.

Preventive maintenance and inspection and testing of equipment are critical to safe operations. Waiting for equipment to fail could also mean waiting for an accident that could harm people and the

environment. Further, a thorough maintenance program will save you money by cutting down-time caused by equipment failures.

You must prepare and implement procedures for maintaining the mechanical integrity of your process equipment, and train your workers in the maintenance procedures. You may use procedures or instructions from equipment vendors, in Federal or state regulations, or in industry codes as the basis of your maintenance program. You should develop a schedule for inspecting and testing your equipment based on manufacturers' recommendations or your own experience.

Your first step will probably be to determine whether you already meet all the requirements. If you review your existing written procedures and determine that they are appropriate, you do not need to revise or redo these procedures. If your workers are already trained in the maintenance procedures and carry them out, you may not need to do anything else.

If you do not have written procedures, you will need to develop them. Your equipment vendors or your trade association may be able to provide procedures and maintenance schedules. Using these as a basis for your maintenance program is acceptable. If there are existing standards, your trade association can provide you with the references. Copies of these standards may also provide a basis for your maintenance program. If there are federal or state regulations that require certain maintenance, you should use these as well.

You need to determine if procedures provided by vendors, manufacturers, trade associations or others are appropriate for your operation. If your safety information indicates that you are operating in a standard way (e.g., using your equipment in the way it was designed), you may assume that these other procedures will work for you. If you are using equipment for purposes other than those for which it was designed, you need to decide whether your use changes the kinds of maintenance required.

(b) The owner or operator shall train or cause to be trained each employee involved in maintaining the on-going mechanical integrity of the process. To ensure that the employee can perform the job tasks in a safe manner, each such employee shall be trained in the hazards of the process, in how to avoid or correct unsafe conditions, and in the procedures applicable to the employees job tasks.

(c) Any maintenance contractor shall ensure that each contract maintenance employee is trained to perform the maintenance procedures developed under (a) of this section.

Once you have written procedures, you must ensure that your maintenance workers are trained in the procedures and in the hazards of the process. As with the training discussed in the previous section, how you provide this training is up to you. We believe that you are in the best position to decide how to train your workers. Vendors may provide the training or videos; you may already provide training on hazards and how to avoid or correct them as part of OSHA's Hazard Communication Standard (29 CFR 1910.1200) training. You do not need to repeat this training to comply with this rule.

If you hire contractors to do your maintenance, you should ensure that they are trained to carry out the procedures. Under the rule, any maintenance contractor is required to ensure that each contract maintenance worker is trained to perform the maintenance procedures developed by the facility. You can help this process by providing training or by developing agreements with the contractor that give you the assurance that only trained workers will be sent to your site. For any outside worker, you must ensure that they are informed of the hazards of your particular process. If you have standard equipment and hire contractors that specialize in servicing your types of processes, you can ensure their knowledge through agreements with the contractor. The Certified Employee Training Program (CETP) and the NPGA Safety Bulletins, published by the National Propane Gas Association (NPGA), meet this criterion.

You may select the combination of training that best fits the duties of each employee involved with maintaining the integrity of your propane storage and handling equipment at your propane storage facility from the maintenance training suggested below in Table 8:

TABLE 8
MAINTENANCE TRAINING

Module	Certified Employee Training Program (CETP)
Basic Principles	Identifying the Proper Use of Personal Protective Equipment
Basic Principles	Identifying the Proper Use of Tools and Equipment
Basic Principles	Identifying by Sight Hand Tools Commonly Used by Service Technicians
Basic Principles	Identifying Pipe/Tube, Pipe/ Fittings, and Associated Tools
Transfer Systems Operations	Identifying Propane Pumps and Their Operation
Transfer Systems Operations	Identifying the Standards for Sizing, Installing and Inspecting Pump Protective Devices
Transfer Systems Operations	Troubleshooting Propane Pumps and Metered Delivery Systems
Transfer Systems Operations	Identifying Parts and Devices Basic to Compressors
Transfer Systems Operations	Maintaining and Troubleshooting Compressors
Distribution Systems	Identifying the Operating Characteristics of Propane Vapor Regulators and Metering Systems
Distribution Systems	Installing Propane Vapor Regulating and Metering Systems
Distribution Systems	Sizing Pipe for Use in Low Pressure Propane Distribution Systems
Distribution Systems	Identifying Steel/Wrought Iron Piping Materials and Installing Procedures
Distribution Systems	Identifying Tubing Materials and Installing Procedures
Distribution Systems	Identifying and Sizing Vaporizer Systems
Distribution Systems	Sizing Propane Liquid Piping Systems
Distribution Systems	Identifying Installing and Servicing Procedures for Vaporizer Systems
Plant Operations	Identifying the Operating Characteristics of Pressure Relief Valves
Plant Operations	Identifying and Installing Gauges in Propane Storage Containers
Plant Operations	Identifying the Operating Characteristics of Check Valves
Plant Operations	Identifying the Operating Characteristics of Service Valves
Plant Operations	Installing Valves in Propane
Plant Operations	Inspecting Servicing and Maintaining Container Valves

Module	Certified Employee Training Program (CETP)
Transfer Systems Operations	Identifying the Operation and Maintenance of Withdrawal Valves
Transfer Systems Operation	Identifying the Operation and Maintenance of Bulkheads and Emergency Shutoff Valves (ESVs)
Distribution Systems Operations	Installing Propane Liquid Distribution and Vaporizer Systems
Transfer Systems Operation	Identifying the Operation and Maintenance of Hoses, Hose End Valves, and Hose Reels
Distribution Systems Operations	Identifying the Causes of Corrosion on Metal Surfaces
Distribution Systems Operations	Identifying Methods and Procedures Used to Protect Metal Structures from Corrosion
Distribution Systems Operations	Identifying Procedures Basic to Installing Anodes and Testing Cathodic Protection Systems
Distribution Systems Operations	Identifying Procedures Used to Pressure Test and Leak Check New Propane Distribution Systems

(d) The owner or operator shall perform or cause to be performed inspections and tests on process equipment. Inspection and testing procedures shall follow recognized and generally accepted good engineering practices. The frequency of inspections and tests of process equipment shall be consistent with applicable manufacturers' recommendations, industry standards or codes, good engineering practices, and prior operating experience.

You must establish a schedule for inspecting and testing equipment associated with your propane storage facility. You may obtain recommendations from manufacturers, vendors, or your trade associations. You should, however, use your own experience as a basis for examining any schedules you obtain from others. Many things may affect whether a schedule is appropriate. The manufacturer may assume a constant rate of use. If your use (e.g., the amount of propane pumped per hour) varies considerably, the variations may affect the wear on the equipment. Extreme weather conditions may also impact wear on equipment.

Talk with your workers as you prepare or adopt these procedures and schedules. If their experience indicates that equipment fails more frequently than the manufacturer expects, you should adjust the inspection schedule to reflect that experience. Your hazard review should have identified these potential problems areas as well and should be used as you develop schedules. For example, if you determined that exterior pipe corrosion is one of the hazards, your schedule would need to address inspections for corrosion and replacement (or painting) before failure occurs. Your trade association may also be able to provide advice on these issues.

WHAT MAINTENANCE DOCUMENTATION MUST I KEEP?

In the RMP, you are required to report on the date of the most recent review or revision of your maintenance procedures and the date of the most recent equipment inspection or test and equipment inspected or tested. You must keep on site your written procedures and schedules as well as any agreements you have with contractors. The rule does not require that you keep particular records of your maintenance program. It is enough for you to have on site information that supports what is reported in the RMP and your implementation of the maintenance program overall. For example, you may want to keep maintenance logs to keep track of when inspections and tests were done.

The "Maintenance Inspection Checklist and Tests for Propane Distribution Facilities"[20] should be completed annually. The NPGA CETP sections referenced above, can be used to prepare maintenance inspection frequencies for individual equipment.

[20] A modified version of NPGA's Bulletin #106-83(Reviewed 1992), "LP-Gas Bulk Storage Safety Inspection Check List" was used to develop these checklists.

Maintenance Inspection Checklist and Tests for Propane Storage Facilities			
I. Construction Code Compliance		**Yes**	**No and Comment**
a)	Check manufacturer's data plate. Is it securely attached and legible? For each fixed storage vessel? On installations with vaporizers, for each vaporizer?		
b)	Are the data plate(s) free of corrosion?		
II. Conditions of Container(s) and Vaporizer(s) and Paint		**Yes**	**No and Comment**
a)	Are above-ground containers properly painted? Fixed storage tanks? On installations with vaporizers, the vaporizers?		
b)	Are containers and vaporizers free of corrosion damage, dents, gouges, or other damage?		
III. Foundations		**Yes**	**No and Comment**
a)	Are foundations in good condition?		
b)	Are footings free of settling which might cause misalignment or piping strain?		
c)	Are containers and vaporizers free of corrosion at masonry contact area?		
d)	Are saddle pads in good condition?		
IV. Container Connections		**Yes**	**No and Comment**
a)	Have excess flow and back flow check valves been recently checked for proper operation?		
V. Tank Fittings		**Yes**	**No and Comment**
a)	Are all ACME (or other type) connectors in good condition with good gaskets and are they plugged or capped? (See NPGA Bulletin #134 "Care and Inspection of ACME Threaded Hose Couplings.")		
b)	Are all unused openings plugged or capped?		
c)	Are all fittings and hoses leak free?		

Maintenance Inspection Checklist and Tests for Propane Storage Facilities			
d)	Are all hoses marked "for LP-Gas service" with a pressure rating of 350 psig (see NPGA Bulletins # 107-91 and #121-89)?		
e)	Are all hoses properly secured, protected, and in serviceable condition and are dust caps on delivery hoses when not in use?		
f)	Are all hoses free from cuts or abrasions that expose the reinforcing fabric and free from soft spots or bulges when under pressure and without kinks, dents or flat spots?		
VI. Gauges		**Yes**	**No and Comment**
a)	Are pressure gauges in good condition and are they suitable for 250 psig service (such as 0-400 psig)?		
b)	Are thermometers in good condition and checked for accuracy?		
c)	On installations with vaporizers having temperature controls, are they in good condition and have they been tested in accordance with manufacturer's recommendations?		
d)	Are liquid level gauging devices approved for the service involved and in good condition?		
e)	On installations with vaporizers having level control devices, are they in good condition and have they been tested in accordance with manufacturer's recommendations?		
VII. Pressure Relief Valves		**Yes**	**No and Comment**
a)	Is the relief valve data plate legible?		
b)	Do relief valves or vent stacks have protective caps or closures to prevent entry of foreign matter?		
c)	Are weep holes for moisture drainage open and is gas impingement on the container avoided?		
d)	Have the relief valves on containers larger than 2000 gallons and on vaporizers been tested or replaced within the last 10 years as per NFPA 58, 1998 Edition recommendation in E-2.3.2?		

Maintenance Inspection Checklist and Tests for Propane Storage Facilities			
e)	Does external visual inspection of the relief valve discharge indicate no corrosion or obstruction?		
VIII. Emergency Shut-off Valves		**Yes**	**No and Comments**
a)	Are valves in good condition and do they shutoff tightly?		
b)	Does the emergency shutoff control system function properly?		
c)	Are the remote shutoff controls installed in an accessible area away from the transfer area?		
d)	Are the shutoff controls clearly identified?		
e)	On installations with vaporizers having automatic shutoff controls, are they accessible, identified and been tested according to manufacturer's recommendations?		
f)	Are the emergency shutoff valves and manual transfer valves on your loading or unloading stations protected from pull away damage by a break-away-stanchion.		
IX. Presence of Combustibles		**Yes**	**No and Comments**
a)	Is the area within 10 ft. of the container(s) and vaporizers free of weeds, long grass, rags, paper, wood or other combustible debris?		
X. Pipe (for Fixed Storage Tanks and Vaporizers)		**Yes**	**No and Comments**
a)	Are all connections tight?		
b)	Are there sufficient lines for all purposes, without dual use, or are make-shift connections being used for some purposes?		
c)	Are connections labeled "liquid" or "vapor"?		
d)	Are there visible signs of exterior corrosion?		
XI. Valves (for Fixed Storage Tanks and Vaporizers)		**Yes**	**No and Comments**
a)	Are valves in good working order?		
b)	Do seats shut off tightly?		
c)	Is packing free of leaks?		

Maintenance Inspection Checklist and Tests for Propane Storage Facilities			
d)	Are necessary valve handles available at the valve location?		
XII. Hydrostatic Relief Valves (for Fixed Storage Tanks and Vaporizers)		**Yes**	**No and Comments**
a)	Are the valves in good working order and not leaking?		
b)	Are the valves fitted with protective caps?		
c)	Are the valve discharges positioned to avoid impinging gas on the tank?		
XII. Transfer Areas		**Yes**	**No and Comments**
a)	Are hoses in good condition and free of deterioration, wear, and blisters? See NPGA Bulletin #114 "Guide to Hose Inspection."		
b)	Are hoses capped or plugged when not is use?		
c)	Are hose couplings properly attached and fully seated on the hose?		
d)	Are hose couplings worn or damaged?		
e)	Are coupling gaskets in good condition?		
f)	Are correct coupling wrenches available?		
g)	Are excess flow valves operating correctly?		
h)	Are the loading and unloading risers protected from traffic?		
I)	Are chock blocks provided for rail cars?		
j)	Have your fire extinguishers been tested and/or serviced?		
k)	Is adequate transfer hose storage available?		
m)	Are the written transfer instructions readily available?		
XIV. Pumps and Compressors		**Yes**	**No and Comments**
a)	Are the shafts free of leaks?		
b)	Are pumps equipped with a spring loaded by-pass valve where required?		
c)	Is the by-pass valve functioning properly?		

Maintenance Inspection Checklist and Tests for Propane Storage Facilities			
d)	Are drive belts or couplings protected by suitable guards?		
e)	Is the compressor crank case oil at the proper level?		
XV. Electrical Equipment		**Yes**	**No and Comments**
a)	Do all switches, etc. function properly?		
b)	Are all housings properly assembled to maintain seal?		

Inspected By:	**Inspection Date:**
These procedures were last reviewed or inspected by:	**Date:**

Name (signature)

Piece of Equipment Inspected:	**Most Recent Date:**

68.58 COMPLIANCE AUDITS

(a) The owner or operator shall certify that they have evaluated compliance with the provisions of this subpart at least every three years to verify that the procedures and practices developed under the rule are adequate and are being followed.

(b) The compliance audit shall be conducted by at least one person knowledgeable in the process.

(c) The owner or operator shall develop a report of the audit findings.

(d) The owner or operator shall promptly determine and document an appropriate response to each of the findings of the compliance audit, and document that deficiencies have been corrected.

(e) The owner or operator shall retain the two (2) most recent compliance audit reports. This requirement does not apply to any compliance audit report that is more than five years old.

Any risk management program should be reviewed periodically to ensure that employees and contractors are implementing it properly. A compliance audit is a way for you to evaluate and

measure the effectiveness of your risk management program. An audit reviews each of the prevention program elements to ensure that they are up-to-date and are being implemented and will help you identify problem areas and take corrective actions. As a result, you'll be running a safer operation.

At least every three years, you must certify that you have evaluated compliance with EPA's requirements for the prevention program for each covered process. At least one person on your audit team must be knowledgeable about the process. You must develop a report of the audit's findings, determine and document an appropriate response to each finding, and document that you have corrected any deficiency.

The purpose of the compliance audit is to ensure that you are continuing to implement the risk management program as required. Remember, the risk management program is an on-going process; it is not a set of documents that you develop and put on a shelf in case the government inspects your site. To be in compliance (and gain the benefits) procedures must be followed on a daily basis; documents must be kept up-to-date. The audit will check these items and provide you with items that need to be improved.

You must check each of item in the prevention program. Because propane storage is a simple process, the audit should not take a long time. You may want to develop a simple checklist of your own. Once you have the checklist, you, your chief operator, or some other person who is knowledgeable about your process, singly or as a team, should walk through the facility and check on each of the items, writing down comments and recommendations. You may want to talk with employees to make sure if they have been trained and are familiar with the procedures.

You must respond to each of the findings and document what actions, if any, you take to address problems. You must take steps to correct any deficiencies you find and document that the deficiencies have been corrected.

You may choose to have the audit conducted by a qualified outside party. For example, you may have someone form another part of your company do the audit or hire an expert in your process. If you do either of these, you should have someone from your facility work with the person, both to understand the findings and answer questions.

Remember, this is an audit of compliance with the prevention program provisions of this rule. You may choose to expand the scope to cover your compliance with other parts of the rule and the overall safety of your operation, but you are not required to do so. You must keep a written record of the findings and actions for five years. You may also want to keep a record of who conducted the audit, but you are not required to do this.

68.60 INCIDENT INVESTIGATION

(a) The owner or operator shall investigate each incident which resulted in, or could reasonably have resulted in a catastrophic release.

(b) An incident investigation shall be initiated as promptly as possible, but not later than 48 hours following the incident.

(c) A summary shall be prepared at the conclusion of the investigation which includes at a minimum:

Date of incident;
Date investigation began;
A description of the incident;
The factors that contributed to the incident; and,
Any recommendations resulting from the investigation.

(d) The owner or operator shall promptly address and resolve the investigation findings and recommendations. Resolutions and corrective actions shall be documented.

(e) The findings shall be reviewed with all affected personnel whose job tasks are affected by the findings.

(f) Investigation summaries shall be retained for five years.

See NPGA "LP-Gas Safety Handbook", NPGA bulletin #202-93 "After Accident Procedure."

Incidents can provide valuable information about site hazards and the steps you need to take to prevent accidental releases. Often, the immediate cause of an incident is the result of a series of other problems that need to be addressed to prevent recurrences. For example, an operator's mistake may be the result of poor training. Equipment failure may result from improper maintenance or misuse of equipment. Without a thorough investigation, you may miss the opportunity to identify and solve these problems.

You must investigate each incident which resulted in, or could have resulted in, a "catastrophic" release of propane. A catastrophic release is one that presents an imminent and substantial endangerment to public health and the environment. Table 9 below briefly summarizes the steps you must take to comply with § 68.60.

TABLE 9
INCIDENT INVESTIGATION REQUIREMENTS

✔**Initiate an investigation promptly**	Begin investigating no later than 48 hours following the incident
✔**Summarize the investigation in a report**	Among other things, this report will include the factors contributing to the incident. Remember that identifying the root cause may be more important than identifying the initiating event. Remember, also, that the purpose of the report is to help management take corrective action.
✔**Address the team's findings and recommendations**	Promptly address the incident report findings and recommendations and document resolutions and corrective actions.
✔**Review the report with your staff, affected employees and contractors**	You must share the report - its findings and recommendations - with workers whose job tasks are affected by the findings.
✔**Retain the report**	Keep incident investigation summaries for five years.

You should start with a simple set of procedures that you will use to begin an investigation. You may want to assign someone to be responsible for compiling the initial incident data and putting together the investigation team. If you have a small facility, your "team" may be one person who works with the local responders, if they were involved in the incident.

The purpose of the investigation is to find out what went wrong and why, so you can prevent it from happening again. Do not stop at the obvious failure or the "initiating" event (e.g., the hose was clogged, the operator forgot to check the connection or the hose cap was not replaced after it was last used); try to determine why the failure occurred. In many cases, the underlying cause will be what matters. If the accident occurred because of operator error, you should determine if the operator made the mistake because he or she had been trained in the wrong procedures or because design flaws made the mistake likely. If you write off the accident as operator error alone you miss the chance to take the steps needed to prevent such errors the next time. Similarly, if equipment fails, you should try to decide whether it had been used or maintained improperly.

Remember, your goals are to prevent accidents, not to blame someone, and correct any problems in your prevention program. In this way, you can prevent recurrences.

In many cases, an investigation will not take long. If you have a complex facility, if equipment has been severely damaged, or the workers seriously hurt, an investigation may take several days. You should talk with the operators who were in the area at the time and check records on maintenance (another reason for keeping logs). If equipment has failed in an unusual way, you may need to talk to

the manufacturer and your trade association to determine if similar equipment has suffered similar failures.

You must develop a summary of the accident and its causes and make recommendations to prevent recurrences. You must address each recommendation and document the resolution and any actions taken. Finally, you must review the findings with operators affected by the findings.

You must maintain the summary of the accident, recommendations, and actions. A sample format is shown in Worksheet 8 below that combines all of these in a single form. Note that the form also includes accident data that you will need for the five-year accident history. These data are not necessarily part of the incident investigation report, but including them will create a record you can use later to create the accident history.

WORKSHEET 8
SAMPLE INCIDENT INVESTIGATION REPORT

Date:	Substance: Propane	Quantity Released:
Duration:	Weather:	
Description:		
Findings	**Recommendations**	**Actions**

The expected completion date of any changes recommended by the investigation.

_____

CHAPTER 6: EMERGENCY RESPONSE

68.90 Applicability.

(a) Except as provided in paragraph (b) of this section, the owner or operator of a stationary source with Program 2 and Program 3 processes shall comply with the requirements of § 68.95.

(b) The owner or operator of a stationary source whose employees will not respond to accidental releases of regulated substances need not comply with § 68.95 of this part provided that they meet the following:

(1) Not Applicable.

(2) For stationary sources with only regulated flammable substances held in a process above the threshold quantity, the owner or operator has coordinated response actions with the local fire department; and

(3) Appropriate mechanisms are in place to notify emergency responders when there is a need for a response.

68.95 Emergency response program.

(a) The owner or operator shall develop and implement an emergency response program for the purpose of protecting public health and the environment. Such program shall include the following elements:

(1) An emergency response plan, which shall be maintained at the stationary source and contain at least the following elements:

(I) Procedures for informing the public and local emergency response agencies about accidental releases;

(ii) Documentation of proper first-aid and emergency medical treatment necessary to treat accidental human exposures; and

(iii) Procedures and measures for emergency response after an accidental release of a regulated substance;

(2) Procedures for the use of emergency response equipment and for its inspection, testing, and maintenance;

(3) Training for all employees in relevant procedures; and

(4) Procedures to review and update, as appropriate, the emergency response plan to reflect changes at the stationary source and ensure that employees are informed of changes.

(b) A written plan that complies with other Federal contingency plan regulations or is consistent with the approach in the National Response Team's Integrated Contingency Plan Guidance ("One Plan") and that, among other matters, includes the elements provided in paragraph (a) of this section if the owner or operator also complies with paragraph (c) of this section.

(c) The emergency response plan developed under paragraph (a)(1) of this section shall be coordinated with the community emergency response plan developed under 42 U.S.C. 11003. Upon request of the local emergency planning committee or emergency response officials, the owner operator shall promptly provide to the local emergency response officials information necessary for developing and implementing the community response plan.

If you have at least one Program 2 or Program 3 process at your facility, then part 68 may require you to implement an emergency response program, consisting of an emergency response plan, emergency response equipment procedures, employee training, and procedures to ensure the program is up-to-date. This requirement applies if your employees will respond to some releases involving regulated substances. The emergency response section of EPA's rule allows the owner or operator of a propane storage facility to decide first whether the employees will respond to an accidental release of propane and then what involvement the employees will have in the event of a release of propane.

If you choose not to have employees respond, then the response actions must be coordinated with the local fire department and appropriate mechanisms must be in place to notify emergency responders when there is a need for a response. You may want to consider this option when there is a public response agency, trained and capable of responding to a propane release and the owner or operator is unable to safely field an appropriate response team. You, however, are responsible for ensuring effective emergency response to any releases at your facility. If your local public responders are not capable of providing such response, you must take steps to ensure that effective response is available (e.g., by hiring response contractors).

WHAT IS RESPONSE?

EPA has adopted the definition of response specified under OSHA's HAZWOPER Standard. OSHA defined emergency response as "a response effort by employees from outside the immediate release area or by other designated responders . . . to an occurrence which results, or is likely to result, in an uncontrolled release of a hazardous substance." The key factor here is that responders are designated for such tasks by their employer. This definition ***excludes*** "responses to incidental releases of hazardous substances where the substance can be absorbed, neutralized, or otherwise controlled at the time of release by employees in the immediate release area, or by maintenance personnel" as well as "responses to releases of hazardous substances where there is no potential safety or health hazard (i.e., fire, explosion or chemical exposure)." Thus, if you expect your employees to take action to end a small leak (e.g., shutting a valve) that does not pose an immediate safety of health hazard, this action could be considered an incidental response and you would not need to develop an emergency response program, if your employees are limited to such activities.

However, due to the nature of propane, only the most minor incidents would be considered incidental releases. In general, most propane releases pose an immediate threat of a fire or explosion. As a result, if you will have your employees involved in any substantial way in responding to releases, you will need to develop an emergency response program. Of course, your emergency response procedures need only to apply to your "response" actions.

If you decide not to have your employees respond, you must coordinate with local emergency planning and response agencies as a substitute for developing an emergency response program. This will help to ensure that your community has a strategy for responding to and mitigating the threat posed by a release of propane from your facility. To do so, you must ensure that you have set up a way to notify emergency responders and your local fire department when there is need for response.

ELEMENTS OF AN EMERGENCY RESPONSE PROGRAM (§ 68.95)

If you will respond to releases of regulated substances with your own employees, your emergency response program must consist of the following elements:

- An emergency response plan (maintained at the facility) that includes:
  - Procedures for informing the public and emergency response agencies about releases,
  - Documentation of proper first aid and emergency medical treatment necessary to treat human exposures, and
  - Procedures and measures for emergency response.

Procedures for using, inspecting, testing, and maintaining your emergency response equipment;

- Training for all employees in relevant procedures; and
- Procedures to review and update, as appropriate, the emergency response plan to reflect changes at the facility and ensure that employees are informed of changes.

Finally, your plan must be coordinated with the community plan developed under the Emergency Planning and Community Right-to-Know Act (EPCRA, also known as SARA Title III). In addition, at the request of local emergency planning or response officials, you must provide any information necessary for developing and implementing the community plan.

Although EPA's required elements are essential to any emergency response program, they are not comprehensive guidelines for creating an adequate response capability. Rather than establish another set of federal requirements for an emergency response program, EPA has limited the provisions of its rule to those the CAA mandates. Because you have propane on site, you are already subject to at least one federal emergency response rule: OSHA's hazardous waste operations and emergency response standard (HAZWOPER) (29 CFR 1910.120). Under HAZWOPER, any facility that handles "hazardous substances" (a broad term that includes all DOT hazardous materials and all CAA regulated substances, and thus applies to all facilities with covered processes) must comply with either 29 CFR 1910.38(a) (emergency action plan requirements) or 1910.119(q). If your employees will respond to a release as described above, you are subject to the 29 CFR 1910.119(q) requirements.

What is a Local Emergency Planning Committee?

Local emergency planning committees (LEPCs) were formed under the Emergency Planning and Community Right-to-Know Act (EPCRA) of 1986. The committees are designed to serve as a community forum for issues relating to preparedness for emergencies involving releases of hazardous substances in their jurisdictions. They consist of representatives from local government (including law enforcement and firefighting), local industry, transportation groups, health and medical organizations, community groups, and the media. LEPCs:

- ✦ Collect information from facilities on hazardous substances that pose a risk to the community;
- ✦ Develop a contingency plan for the community based on this information; and
- ✦ Make information on hazardous substances available to the general public.

Contact the mayor's office or the county emergency management office for more information on your LEPC.

EMERGENCY RESPONSE PLAN

If you choose to respond, then you must prepare a written emergency response plan. You may wish to consider using a format that complies with other Federal contingency plans such as the National Response Team's Integrated Contingency Plan (One Plan) with procedures for the use of emergency response equipment and appropriate training for the response personnel. At a minimum, your plan must describe:

- ✦ Your procedures for informing the public and offsite emergency response agencies of a release. This must include the groups and individuals that will be contacted and why, the means by which they will be contacted, the time frame for notification, and the information that will be provided.

- ✦ The proper first aid and emergency medical treatment for employees, first responders, and members of the public who may have been exposed to a release of a regulated substance. This must include standard safety precautions for victims (e.g., apply water to exposed skin immediately) as well as more detailed information for medical professionals. You must also indicate who is likely to be responsible for providing the appropriate treatment: an employee, an employee with specialized training, or a medical professional.

- ✦ Your procedures for emergency response in the event of a release of a regulated substance. This must include descriptions of the actions to be taken by employees and other individuals on-site over the entire course of the release event:

  - ▸ Activation of alarm systems and interpretation of signals;
  - ▸ Safe evacuation, assembly, and return;

- Selection of response strategies and incident command structure;
- Use of response equipment and other release mitigation activities; and
- Post-release equipment and personnel cleanup and decontamination.

Table 10 can be used:

TABLE 11
EMERGENCY RESPONSE PLAN - NPGA REFERENCES

Emergency Response Plan Criteria	NPGA Reference Procedure
Procedures for informing the public and local responders.	LP-Gas Safety Handbook, "Guidelines for Developing Plant Emergency Procedures," NPGA #207-94.
Document first-aid and any emergency medical treatment necessary to treat exposure to propane and/or a propane fire.	LP-Gas Safety Handbook, "Material Safety Data Sheet, MSDS, for Odorized Propane," NPGA #210-89.
Document the actions required to respond to a propane release.	1. LP-Gas Safety Handbook, "How to Control LP-Gas Leaks and Fires," NPGA #200-89. 2. LP-Gas Safety Handbook, "How to Handle Small LP-Gas Fires with a Portable Fire Extinguisher," NPGA #204-88.

If you have already developed a written emergency response plan that incorporates the NPGA bulletins listed above and that addresses the specific criteria listed in EPA's rule, then you are not required to rework your existing plans. Assemble the written plans that you have already developed and review them to ensure that they are up-to-date.

PLANNING COORDINATION

One of the most important issues in an emergency response program is deciding which response actions will be assigned to employees and which will be handled by offsite personnel. As a result, talking to public response organizations will be critical when you develop your emergency response procedures. Although EPA is not requiring you to be able to respond to a release alone, you should not simply assume that local responders will be able to manage an emergency. You must work with them to determine what they can do, and then expand your own abilities or establish mutual aid agreements or contracts to handle those situations for which you lack the appropriate training or equipment.

If you have already coordinated with local response agencies on how to respond to potential releases of regulated substances and you have ensured an effective response, you do not need to take any further action.

Keep in mind: Your coordination must involve planning for releases of regulated substances from all covered processes and must cover:

- What offsite response assistance you will require for potential release scenarios, including fire-fighting, security, and notification of the public;
- How you will request offsite response assistance; and
- Who will be in charge of the response operation and how will authority be delegated down the internal and offsite chain of command.

You will decide what degree of response your employees can safely take, weighing the type of response the public responders are capable of supplying and designing a plan that melds the two together. You can coordinate the facility plan with your community plan by involving your local emergency response officials in the development of your facility emergency response plan. Your facility plan can take advantage of any parts of the community plan where there is overlap. An example of overlap may be the procedures in the community plan concerning public notification and closure of streets in the vicinity of a release and the requirement that the written facility plan contain procedures for informing the public. In talking with your emergency planning officials, you may decide to share the responsibility for public notification with the facility taking responsibility for the nearby neighbors very close to the facility and the community notification system taking responsibility for neighbors further away.

EMERGENCY EQUIPMENT

If you already have written procedures for using and maintaining your emergency response equipment, you do not need to write new procedures.

Keep in mind: Your procedures must apply to any emergency equipment relevant to a response involving a covered process, including all detection and monitoring equipment, alarms and communications systems, and personal protective equipment not used as part of normal operations (and thus not subject to the prevention program requirements related to operating procedures and maintenance). The procedures must describe:

- How and when to use the equipment properly;
- How and when the equipment should receive routine maintenance; and
- How and when the equipment should be inspected and tested for readiness.

Written procedures comparable to those necessary for process-related equipment under Program 2 Prevention Programs will be considered sufficient to meet this requirement.

EMPLOYEE TRAINING

If you already train your employees in how to respond to (or evacuate from) releases of regulated substances, then you do not need a new training program.

Keep in mind: Your training must address the actions to take in response to releases of regulated substances from all covered processes. The training should be based directly on the procedures that

you have included in your emergency response plan and must be given to all employees and contractors on site. Individuals should receive training appropriate to their responsibilities:

- If they will only need to evacuate, then their training should cover when and how to evacuate their location.
- If they may need to activate an alarm system in response to a release event, then their training should cover when and how to use the alarm system.
- If they will serve on an emergency response team, then their training should cover how to use emergency equipment and how the incident command system works.

Emergency response training conducted in compliance with the OSHA HAZWOPER Standard and 29 CFR 1910.38 will be considered sufficient to meet this requirement.

RESPONSE PLAN EVALUATION

If you already have a formal practice for regular review and updates of your plan based on changes at the facility, you do not need to develop additional procedures.

Keep in mind: You must also identify the types of changes to the facility that would cause the plan to be updated (e.g., a new covered process) and include a method of communicating any changes to the plan to your employees (e.g., through training). You may want to set up a regular schedule on which you review your entire emergency response plan and identify any special conditions (e.g., a drill or exercise) that could result in an interim review.

CHAPTER 7: RISK MANAGEMENT PLAN

If you are subject to the risk management program rule, you must submit your Risk Management Plan (RMP) which describes your risk management program. EPA has developed an electronic submission system that will make filing the RMP easy. To submit your RMP electronically, you will need to download free software, called RMP*Submit, from EPA's Internet website at http://www.epa.gov/ceppo. The software will provide you with all the necessary instructions to complete your RMP. You submit the completed electronic RMP to EPA by copying it onto a 3½-inch diskette and mailing the diskette to EPA. If you do not have access to a computer, you may file a paper version. The necessary submission forms for the paper version are available from the hotline or EPA's Internet website at http://www.epa.gov/ceppo.

The RMP consists of a brief executive summary and a set of data. The executive summary should be a brief description of the facility, the worst-case release scenario, steps you take to prevent accidents (for example, complying with state and local laws), emergency response information (for example, your coordination with the fire department), and any steps you are planning to take to improve safety (for example, upgrading equipment to meet newer editions of NFPA-58). The rest of the RMP is filling in names, addresses, and numbers, and checking boxes. If you have completed the previous chapters of this guidance, you have already gathered most of the information that you will need to complete the RMP.

Your first RMP must be submitted by June 21, 1999.

ACRONYMS

ANSI	**A**merican **N**ational **S**tandard **I**nstitute
ASME	**A**merican Society of Mechanical Engineers
ASTM	American Society of Testing Materials
BLEVE	Boiling Liquid Expanding Vapor Explosion
CAA	Clean Air Act
CAS	Chemical Abstract Service
CEPPO	Chemical Emergency Planning and Prevention Office of EPA
CETP	Certified Employee Training Program
CFR	Code of Federal Regulations
DOT	Department of Transportation
°F	Degrees Fahrenheit
FR	Federal Register
ft	Feet
EPA	Environmental Protection Agency (United States)
EPCRA	Emergency Planning and Community Right-to-know Act of 1986
GPA	Gas Processors Association
GPS	Geological Positioning System
HAZWOPER	HAZardous Waste Operators and Emergency Response
kg	Kilograms
LEL	Lower Explosive Limit or lower flammable limit
LEPC	Local Emergency Planning Committee
LFL	Lower Flammable Limit or Lower Explosive Limit (**LEL)**
LP-Gas	Liquefied Petroleum Gas or Propane
kw	Kilowatts
m	Meters
m^2	Meters x Meters or Meters Squared. A measure of area.
mi	Miles
MSDS	Material Safety Data Sheet(s)
NAICS	North American Industry Classification System (formerly Standard Industrial Classification [SIC] codes)
NFPA	National Fire Protection Association
NIOSH	National Institute of Occupational Safety and Health
NPGA	National Propane Gas Association
OCA	*RMP Offsite Consequence Analysis Guidance* from EPA
OPA-90	Oil Pollution Act of 1990
OSHA	Occupational Safety and Health Administration (Department of Labor)
PHA	Process Hazard Analysis
psi, psia, psig	pounds per square inch, pounds per square inch absolute, pounds per square inch gauge
RCRA	Resource Conservation and Recovery Act (EPA)
RMP	Risk Management Plan (documents to submit)
SCFM	Standard Cubic Feet per Minute
SERC	State Emergency Response Commission

SPCC	Spill Prevention Control and Countermeasures
TWA	Time Weighed Average
U1A	A Form describing construction kept by National Boiler Safety on every pressure vessel constructed under the ASME Boiler Safety Code
UFL	Upper Flammable Limit or Upper Explosive Limit (**UEL**)
USGS	United States Geological Survey